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THE

CHILD'S FIRST BOOK

IN

ARITHMETIC.

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THE

CHILD'S FIRST BOOK

IN

ARITHMETIC.

BY NELSON M. HOLBROOK,
A PRACTICAL TEACHER.

PORTLAND:
SANBORN & CARTER.
1850.

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PREFACE.

THERE is a considerable space of time, even after children have learned to read and spell with some facility, and before they are capable of entering upon the study of the more difficult departments of science, when something adapted to their peculiar wants is needed to occupy their minds, and amuse them during such hours of the school as are not devoted to reading and spelling. If anything can be presented during this period which will attract the attention, and give the minds of children a moderate and healthy exercise, it will relieve them of many tedious hours, and lay a foundation for their future progress in any branch of science which they may afterwards pursue.

It is the design of this little work to furnish this desideratum. The first part contains several beautiful engravings, exhibiting scenes of juvenile sports and employments, which afford materials for questions, and also assist the young pupil in their solution.

The tables preceding the lessons present every combination of numbers that is employed in the formation or the solution of the practical examples that immediately follow them. These examples commence with the most simple combination of numbers, illustrated by visible objects, and gradually advance to the more difficult, as the pupil acquires the ability to master them.

A solution of the first question in each exercise, and in every new combination of numbers, is given, not only as a model form of solution for the pupil, but also to impress upon his mind the importance of analyzing every question, and of giving a reason for each step in the operation.

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The lessons in Drawing and Writing are introduced for the purpose of furnishing an interesting and instructive pastime, during the leisure hours of the pupil.

With this explanation of the object and plan of the work, the author would express a hope that no teacher will permit his pupils to advance faster than they fully comprehend the subject. If such a course is pursued, it is believed that the work is so arranged, in the variety of the questions, and the frequency of the review, that it cannot be completed without imparting to the learner a pretty accurate and thorough knowledge of the first principles of arithmetic.

Portland, Sept., 1849.

SUGGESTIONS TO TEACHERS.

While children are attending to the introductory lessons in this work, the teacher should give familiar illustrations upon the black-board at every recitation.

The illustrations, by visible objects, in Addition, Subtraction, Multiplication, Division, and Fractions, should also be extended, if necessary, until each member of the class fully comprehends the process of performing examples according to the principles of each subject respectively.

The teacher should also require an analysis of each question, so far as time will allow. The pupils may perform the questions mentally, and when called upon by the teacher, should first give the answer, and then the analysis, or process of obtaining it.

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MENTAL ARITHMETIC.

INTRODUCTION.

Every experienced teacher has, undoubtedly, often seen and felt more or less difficulty in teaching children the first principles of numbers.

This difficulty, it is believed, very commonly, if not always, arises from the confused and indefinite ideas in the minds of children in regard to the *real* and *relative* value of the different numbers, either when expressed by words or figures.

It is very important, therefore, that teachers take particular pains to impart clear and correct views on this point, at the very commencement of the pupil's course. They should endeavor to illustrate plainly, that all numbers are composed of *single* or individual things, or quantities, and that the figures used to represent them *always* express a certain number of single things, units or ones, respectively.

For the purpose of doing this in an intelligible manner, and at the same time making the subject interesting to young children, the teacher may draw some visible object on the blackboard, — a tree, for example, as represented on the following page, — and then ask the same or similar questions as are there introduced, varying and repeating the exercise until each member of the class fully comprehends what is meant by the *names* of the different numbers, one, two, three, &c., and clearly understands their relative value; that is, whether *five* means a *greater* or *less* number of things than *six*, *ten* a *greater* or *less* number of things than *nine*, &c.

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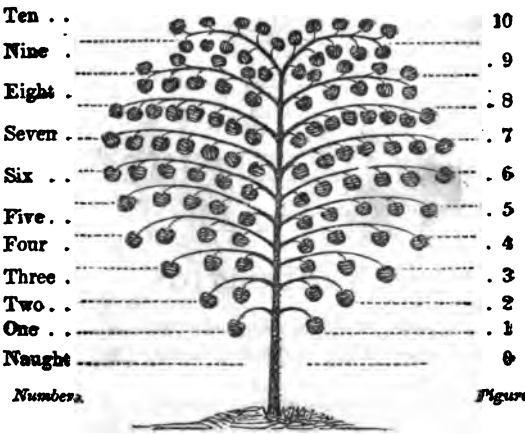

LESSON I.

REMARK. We will call this a tree filled with apples; and you may count the apples on each branch, as I point to them, saying *one, two, three,* &c.

1. Count the apples on the *first* or lowest branch, on the left hand side of the tree.

2. Count the apples on the *second* branch, on the same side of the tree.

3. Count the apples on the *third* branch. Count the apples on the *fourth* branch. Count the apples on the *fifth* branch. Count the apples on the *sixth* branch.

4. Count the apples on the *seventh* branch. Count the apples on the *eighth* branch. Count the apples on the *ninth* branch. Count the apples on the *tenth* branch.

5. Now count the apples on the right hand side of the tree, in the same manner.

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6. You may now count, as I point to them, and tell me the *number* of apples on each branch of the tree, on the left hand side.

7. How many apples are there on the *first* branch? How many are there on the *second* branch? Does the number *two* here mean *more* or *fewer* apples than the number *one?* How many more? Then *one* and *one* more make how many?

8. How many apples are there on the *third* branch? Does the number *three* here mean *more* or *fewer* apples than the number *two?* How many more? Then *two* and *one* more make how many?

REMARK. The teacher may proceed in this manner with all the branches on the left hand side of the tree, and then, commencing with the *tenth* branch, ask similar questions in regard to the different branches on the right hand side; thus,

9. How many apples are there on the *tenth* branch, on the right hand side of the tree? How many are there on the *ninth* branch? Does the number *nine* here mean a *greater* or *less* number of apples than the number *ten?* How many less, &c.?*

10. You may now count, commencing on the left hand side, and tell me the number of branches on both sides of the tree.

11. Now tell me how many apples there are on the first and second branches, on the left hand side of the tree, when counted together.

12. How many are there on the first, second and third? On the first, second, third and fourth? On the first, second, third, fourth and fifth, &c.?

* The teacher may here give the names of the numbers employed when it is required to express more than ten, as eleven, twelve, &c., and also show the class how they are composed from these first ten numbers.

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LESSON II.

REMARK. This lesson presents the printed and written figures, and the Roman letters, by which numbers are commonly expressed. It should be carefully studied by children, until they can read the figures with facility when written on the black-board, or when they meet with them in books.

Numbers.	Printed Figures.	Written Figures.	Roman Letters.
Naught	0	0	
One	1	1	I
Two	2	2	II
Three	3	3	III
Four	4	4	IV
Five	5	5	V
Six	6	6	VI
Seven	7	7	VII
Eight	8	8	VIII
Nine	9	9	IX
Ten	10	10	X
Eleven	11	11	XI
Twelve	12	12	XII
Thirteen	13	13	XIII
Fourteen	14	14	XIV
Fifteen	15	15	XV
Sixteen	16	16	XVI
Seventeen	17	17	XVII
Eighteen	18	18	XVIII
Nineteen	19	19	XIX
Twenty	20	20	XX
Twenty-one	21	21	XXI
Twenty-two	22	22	XXII
Twenty-three	23	23	XXIII
Twenty-four	24	24	XXIV

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Numbers.	Printed Figures.	Written Figures.	Roman Letters.
Twenty-five	25	25	XXV
Twenty-six	26	26	XXVI
Twenty-seven	27	27	XXVII
Twenty-eight	28	28	XXVIII
Twenty-nine	29	29	XXIX
Thirty	30	30	XXX
Thirty-one	31	31	XXXI
Thirty-two	32	32	XXXII
Thirty-three, &c.	33	33	XXXIII
Forty	40	40	XL
Forty-one	41	41	XLI
Forty-two, &c.	42	42	XLII
Fifty	50	50	L
Fifty-one, &c.	51	51	LI
Sixty	60	60	LX
Sixty-one, &c.	61	61	LXI
Seventy	70	70	LXX
Seventy-one, &c.	71	71	LXXI
Eighty	80	80	LXXX
Eighty-one, &c.	81	81	LXXXI
Ninety	90	90	XC
Ninety-one, &c.	91	91	XCI
One hundred	100	100	C
One hundred and eight	108	108	CVIII
One hundred and ten	110	110	CX
One hundred and twenty	120	120	CXX
One hundred and twenty-one	121	121	CXXI
One hundred and thirty-two	132	132	CXXXII
One hundred and forty-four	144	144	CXLIV
Two hundred	200	200	CC

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LESSON III.

REMARK. The children should now be furnished with slates and pencils, and required to read the following numbers from the book, or when written on the black-board by the teacher, and then to copy them on their slates in straight columns.

2	7	15	23	28
1	9	17	22	30
3	11	16	24	32
5	10	18	26	31
4	12	20	25	33
6	14	19	27	35
8	13	21	29	34

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LESSON IV.

36	43	53	60	67
38	45	52	62	69
37	47	54	61	71
39	46	56	63	70
41	48	55	65	76
40	50	57	64	79
42	49	59	66	82
44	51	58	68	86

LESSON V.

83	98	88	111	121
97	75	77	101	130
73	92	89	110	129
94	84	91	120	133
80	90	85	115	136
74	96	99	122	131
93	72	100	125	139
95	81	105	118	140
87	78	108	112	144

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ADDITION.

LESSON I.

ADDITION means putting two or more numbers or things together into one sum; thus,

1. 1 apple and 1 apple more make 2 apples.

2. 2 stars and 1 star more make 3 stars.

3. 2 lemons and 2 lemons more make 4 lemons.

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ADDITION TABLE,*—PART I.

1	and	1	are	2	1	and	7	are 8
1	and	2	are	3	1	and	8	are 9
1	and	3	are	4	1	and	9	are 10
1	and	4	are	5	1	and	10	are 11
1	and	5	are	6	1	and	11	are 12
1	and	6	are	7	1	and	12	are 13
2	and	1	are	3	2	and	7	are 9
2	and	2	are	4	2	and	8	are 10
2	and	3	are	5	2	and	9	are 11
2	and	4	are	6	2	and	10	are 12
2	and	5	are	7	2	and	11	are 13
2	and	6	are	8	2	and	12	are 14

MENTAL EXERCISES.

1. You can here see 2 little girls and 1 boy going to school with their teacher; how many girls and boys are there when counted together? ANS. 3.

Why 3? *Because* 2 *and* 1 *more make* 3.

2. If Sarah has 4 books, and her mother should give her 1 more, how many books would she then have? Why?

3. Mary has 2 books in the school-room, and 2 at home; how many books has she in all? Why?

4. If Henry should buy an orange for 5 cents, and a lead pencil for 2 cents, how many cents would he pay for both of them? Why?

5. If a spelling-book cost 10 cents, and a picture-book 2 cents, how many cents will they both cost?

* The tables in this book are designed to aid the learner in answering the questions that immediately follow them. Each one should be committed to memory, and first recited in order, thus, 1 and 1 are 2, &c.; and then the teacher should vary the order by miscellaneous questions.

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LESSON II.

ADDITION TABLE,—PART II.

3 and 1 are 4	3 and 7 are 10
3 and 2 are 5	3 and 8 are 11
3 and 3 are 6	3 and 9 are 12
3 and 4 are 7	3 and 10 are 13
3 and 5 are 8	3 and 11 are 14
3 and 6 are 9	3 and 12 are 15

4 and 1 are 5	4 and 7 are 11
4 and 2 are 6	4 and 8 are 12
4 and 3 are 7	4 and 9 are 13
4 and 4 are 8	4 and 10 are 14
4 and 5 are 9	4 and 11 are 15
4 and 6 are 10	4 and 12 are 16

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MENTAL EXERCISES.

1. If there are 4 boys in this class, and 1 more should join them, how many boys would there be in the class then? ANS. 5 boys.

Why 5? *Because* 4 *and* 1 *more make* 5.

2. If James should answer 3 questions at this recitation, and John 3 more, how many would both together answer? Why?

3. George and Lyman are each 5 years old, and Martin is just 3 years older than they are; what is the age of Martin? Why?

4. In the teacher's book-case, there are 6 books on one shelf, and 4 on another; how many books are there on the two shelves? Why?

5. If James had 4 cents in one hand, and 4 in the other, how many cents would he have in both hands? Why?

6. John gave 6 apples to George, and kept 3 for himself; how many apples had he at first? Why?

7. If Martin had 7 walnuts, and James should give him 4 more, how many walnuts would he then have? Why?

8. George bought 8 marbles, and his uncle gave him 4 more; how many marbles had he then? Why?

9. Lyman paid 11 cents for a book, and 3 cents for a lemon; what was the cost of the book and lemon? Why?

10. John gave 10 cents for some paper, and 3 cents for some steel pens; how many cents did he give for both? Why?

11. James had 12 pears, and Martin had 4 more than James; how many pears had Martin? Why?

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LESSON III.

ADDITION TABLE,—PART III.

5 and 1 are 6	5 and 7 are 12
5 and 2 are 7	5 and 8 are 13
5 and 3 are 8	5 and 9 are 14
5 and 4 are 9	5 and 10 are 15
5 and 5 are 10	5 and 11 are 16
5 and 6 are 11	5 and 12 are 17

6 and 1 are 7	6 and 7 are 13
6 and 2 are 8	6 and 8 are 14
6 and 3 are 9	6 and 9 are 15
6 and 4 are 10	6 and 10 are 16
6 and 5 are 11	6 and 11 are 17
6 and 6 are 12	6 and 12 are 18

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MENTAL EXERCISES.

1. Here are 5 boys at work building a wharf to fish from, and two more are now fishing; how many boys are there in all? ANS. 7 boys.

Why 7? *Because* 5 *and* 2 *more make* 7.

2. The first time Benjamin came here to fish, he caught 5 minnows, and 4 trouts; how many fish did he catch of both kinds? Why?

3. Franklin at the same time caught 6 minnows, and 3 white fish; how many fish of both kinds did Franklin catch? Why?

4. When the other three boys came the next day, Samuel and Eli caught 7 haddock, and Thomas 5 salmon; how many fish did Samuel, Eli, and Thomas all catch? Why?

5. Benjamin and Thomas sold 9 of their fish, and the other three boys sold 6 of theirs; how many fish did they all sell? Why?

6. Franklin gave 8 cents to a poor beggar, and Benjamin gave him 5 cents; how many cents did the beggar receive? Why?

7. Samuel paid 9 shillings for a pair of skates, and 5 shillings for a cap; how many shillings did he pay for both? Why?

8. Eli saw 10 birds on a tree, and 6 more on the ground; how many birds did he see in all? Why?

9. If a boy should pay 11 cents for a quart of chestnuts, and 5 cents for a ball, how many cents would he pay for the chestnuts and ball? Why?

10. A flour-merchant sold 12 barrels of flour one day, and 6 the next; how many barrels did he sell in the two days? Why?

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LESSON IV.

ADDITION TABLE,—PART IV.

7 and 1 are 8	7 and 7 are 14
7 and 2 are 9	7 and 8 are 15
7 and 3 are 10	7 and 9 are 16
7 and 4 are 11	7 and 10 are 17
7 and 5 are 12	7 and 11 are 18
7 and 6 are 13	7 and 12 are 19

8 and 1 are 9	8 and 7 are 15
8 and 2 are 10	8 and 8 are 16
8 and 3 are 11	8 and 9 are 17
8 and 4 are 12	8 and 10 are 18
8 and 5 are 13	8 and 11 are 19
8 and 6 are 14	8 and 12 are 20

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MENTAL EXERCISES.

1. Frank has 7 red roses, and 2 white ones, in his garland; how many of both kinds has he? ANS. 9.

Why 9? *Because* 7 *and* 2 *more make* 9.

2. If Susan should gather 7 white lilies, and 4 primroses, for her brother, how many flowers of both kinds would she gather? Why?

3. Nancy has 8 yellow roses, and 2 dahlias, in her basket; how many flowers has she in all? Why?

4. Frank carried home to his mother 7 red pinks, and 5 white ones; how many pinks of both kinds did he carry home? Why?

5. Margaret has 8 flower-pots in one room, and 4 in another; how many has she in the two rooms? Why?

6. Susan paid 8 cents for three yards of blue ribbon, and 5 cents for a comb; how many cents did she pay for both? Why?

7. If a muff is worth 7 dollars, and a silk dress 7 dollars more, how many dollars are they both worth? Why?

8. Nancy gave 8 cents for her Testament, and 7 cents for a paper of needles; how many cents did she give for her Testament and needles? Why?

9. If you should answer 8 questions at this recitation, and 8 at the next, how many questions would you answer at the two recitations? Why?

10. Margaret is now 10 years old; how old will she be 8 years from this time? Why?

11. A farmer sold a cow for 12 dollars, and a ton of hay for 8 dollars; how many dollars did he receive? Why?

How many are 11 and 7? Why?

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LESSON V.

ADDITION TABLE, — PART V.

9 and 1 are 10	9 and 7 are 16
9 and 2 are 11	9 and 8 are 17
9 and 3 are 12	9 and 9 are 18
9 and 4 are 13	9 and 10 are 19
9 and 5 are 14	9 and 11 are 20
9 and 6 are 15	9 and 12 are 21
10 and 1 are 11	10 and 7 are 17
10 and 2 are 12	10 and 8 are 18
10 and 3 are 13	10 and 9 are 19
10 and 4 are 14	10 and 10 are 20
10 and 5 are 15	10 and 11 are 21
10 and 6 are 16	10 and 12 are 22

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MENTAL EXERCISES.

1. In my morning walk I saw 9 girls and 2 boys at play; how many girls and boys did I see? Ans. 11.

Why 11? *Because* 9 *and* 2 *more make* 11.

2. Anna is 9 years old, and her little sister is 4; what is the sum of both their ages? Why?

3. Myron has 9 young rabbits, and 6 old ones; how many has he in all? Why?

4. Julia reads 10 pages of history every morning, and 2 in the evening; how many pages does she read each day? Why?

5. Helen wrote 10 lines at the last exercise, and Esther wrote 5; how many lines did both write? Why?

6. Luke spells and defines 9 words in the forenoon, and 7 in the afternoon; how many words does he spell and define during the day? Why?

7. Emily gave 10 shillings for a yard of silk, and 3 shillings for a pair of gloves; how much did she give for both? Why?

8. If a firkin of butter is worth 9 dollars, and a cord of wood 7, how many dollars are they both worth? Why?

9. A farmer has 10 acres of wheat in one field, and 6 in another; how many acres of wheat has he in the two fields? Why?

10. Martha purchased 9 yards of gingham for a dress, and her sister purchased the remainder of the piece, which was 8 yards; how many yards were there in the piece? Why?

11. If you have 11 quills in one bunch, and 9 in another, how many quills are there in the two bunches? Why?

How many are 12 and 10? Why?

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LESSON VI.

ADDITION TABLE, — PART VI.

11 and 1 are 12	11 and 7 are 18
11 and 2 are 13	11 and 8 are 19
11 and 3 are 14	11 and 9 are 20
11 and 4 are 15	11 and 10 are 21
11 and 5 are 16	11 and 11 are 22
11 and 6 are 17	11 and 12 are 23

12 and 1 are 13	12 and 7 are 19
12 and 2 are 14	12 and 8 are 20
12 and 3 are 15	12 and 9 are 21
12 and 4 are 16	12 and 10 are 22
12 and 5 are 17	12 and 11 are 23
12 and 6 are 18	12 and 12 are 24

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MENTAL EXERCISES.

1. I have 11 pears, and 2 apples, in my fruit-basket; how many apples and pears have I in all? Ans. 13.

Why 13? *Because* 11 *and* 2 *more make* 13.

2. Edwin found 12 apples under one tree, and 3 under another; how many did he find under the two trees? Why?

3. Austin sold some pears for 11 cents, and some peaches for 5 cents; how many cents did he receive for his peaches and pears? Why?

4. A boy, having some peaches given him, put 12 into his hat, and the remaining 7 into his pockets; how many peaches were given him? Why?

5. In an orchard there are 11 apple-trees, and 7 pear-trees; how many trees are there in the orchard? Why?

6. Elias bought an arithmetic for 12 cents, and sold it for 8 cents more than he gave for it; for how many cents did he sell it? Why?

7. A man bought three hats for 11 dollars, and two pairs of boots for 9 dollars; how many dollars did he pay for the whole? Why?

8. A drover sold five sheep for 12 dollars, and two calves for 10 dollars; how many dollars did he receive? Why?

9. If you should perform 11 examples in your arithmetic to-day, and 11 more to-morrow, how many would you perform in the two days? Why?

10. There are 12 questions in the last exercise, and 11 in this; how many questions are there in the two exercises? Why?

11. How many are 12 and 12 and 2?

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LESSON VII.

MISCELLANEOUS REVIEW.

1. 6 and 2 are how many?
2. 5 and 2 are how many?
3. 7 and 2 are how many?
4. 9 and 2 are how many?
5. 8 and 2 are how many?
6. 11 and 2 are how many?
7. 10 and 2 are how many?
8. 12 and 2 are how many?
9. 4 and 3 are how many?
10. 6 and 3 are how many?
11. 5 and 3 are how many?
12. 7 and 3 are how many?
13. 9 and 3 are how many?
14. 8 and 3 are how many?
15. 11 and 3 are how many?
16. 10 and 3 are how many?
17. 12 and 3 are how many?
18. 6 and 4 are how many?
19. 5 and 4 are how many?
20. 7 and 4 are how many?
21. 9 and 4 are how many?
22. 8 and 4 are how many?
23. 11 and 4 are how many?
24. 10 and 4 are how many?
25. 12 and 4 are how many?
26. 6 and 5 are how many?
27. 5 and 5 are how many?
28. 7 and 5 are how many?
29. 9 and 5 are how many?
30. 8 and 5 are how many?

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LESSON VIII:

MISCELLANEOUS REVIEW.

1. 11 and 5 are how many?
2. 10 and 5 are how many?
3. 12 and 5 are how many?
4. 6 and 6 are how many?
5. 8 and 6 are how many?
6. 7 and 6 are how many?
7. 9 and 6 are how many?
8. 11 and 6 are how many?
9. 10 and 6 are how many?
10. 12 and 6 are how many?
11. 7 and 7 are how many?
12. 9 and 7 are how many?
13. 8 and 7 are how many?
14. 11 and 7 are how many?
15. 10 and 7 are how many?
16. 12 and 7 are how many?
17. 9 and 8 are how many?
18. 8 and 8 are how many?
19. 11 and 8 are how many?
20. 10 and 8 are how many?
21. 12 and 8 are how many?
22. 9 and 9 are how many?
23. 11 and 9 are how many?
24. 10 and 9 are how many?
25. 12 and 9 are how many?
26. 11 and 10 are how many?
27. 10 and 10 are how many?
28. 12 and 10 are how many?
29. 11 and 11 are how many?
30. 12 and 12 are how many?

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LESSON IX.

MISCELLANEOUS REVIEW.

1. 4, and 3, and 5, are how many? Ans. 12.

Why 12? *Because* 4 *and* 3 *are* 7, *and* 5 *more make* 12.

2. 4, and 2, and 7, are how many?
3. 8, and 4, and 5, are how many?
4. 9, and 2, and 4, are how many?
5. 3, and 4, and 7, are how many?
6. 3, and 3, and 6, are how many?
7. 5, and 3, and 8, are how many?
8. 4, and 5, and 9, are how many?
9. 6, and 4, and 10, are how many?
10. 8, and 3, and 11, are how many?
11. 7, and 5, and 12, are how many?
12. 6, and 3, and 8, are how many?
13. 8, and 5, and 1, are how many?
14. 9, and 6, and 2, are how many?
15. 7, and 9, and 3, are how many?
16. 9, and 8, and 4, are how many?
17. 10, and 4, and 7, are how many?
18. 11, and 6, and 2, are how many?
19. 12, and 8, and 1, are how many?
20. 10, and 5, and 3, are how many?
21. 11, and 8, and 4, are how many?
22. 12, and 6, and 5, are how many?
23. 10, and 7, and 6, are how many?
24. 11, and 9, and 5, are how many?
25. 12, and 9, and 7, are how many?
26. 10, and 10, and 10, are how many?
27. 11, and 11, and 11, are how many?
28. 12, and 12, and 12, are how many?

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LESSON X.

MISCELLANEOUS REVIEW.

1. A merchant-tailor sold a coat for 10 dollars, a vest for 3 dollars, and a pair of pantaloons for 5 dollars; how many dollars did he receive? ANS. 18 dollars.

Why 18 dollars? *Because* 10 *dollars and* 3 *dollars are* 13 *dollars, and* 5 *dollars more make* 18 *dollars.*

2. Miles paid 4 cents for pens, 8 cents for an ink-stand, and 10 cents for a bottle of ink; how many cents did he pay for the whole? Why?

3. A drover bought 6 sheep of one man, 8 of another, and 10 of another; how many sheep did he buy in all? Why?

4. Jane gave 6 cents for a thimble, 5 cents for a paper of needles, and 12 cents for three spools of thread; how many cents did the whole cost? Why?

5. Charles hoed corn three days; the first day he hoed 12 rows, the second day 10 rows, and the third day 10 rows; how many rows of corn did he hoe in the three days? Why?

6. Elizabeth bought an arithmetic for 15 cents, a pencil for 1 cent, and a slate for 10 cents; how much did she pay for all of them? Why?

7. A cabinet-maker sold a bureau for 14 dollars, a table for 10 dollars, and a rocking-chair for 6 dollars; how many dollars did he receive for the whole? Why?

8. A benevolent little boy gave 20 cents for foreign missions, 10 cents for domestic missions, and 8 cents for the Bible society; how many cents did he give for missions and the Bible society? Why?

9. William's reader cost 25 cents, his Testament 12 cents, his writing-book 10 cents, and his lead pencil 3 cents; what was the cost of the whole? Why?

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SUBTRACTION.

LESSON I.

SUBTRACTION means taking a less number or quantity from a greater; thus,

1. 1 pear taken from 2 pears leaves 1 pear.

2. 1 ball taken from 3 balls leaves 2 balls.

3. 2 eggs taken from 4 eggs leave 2 eggs.

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SUBTRACTION TABLE, — PART I.

1	from	1	leaves 0	1	from	7	leaves 6
1	from	2	leaves 1	1	from	8	leaves 7
1	from	3	leaves 2	1	from	9	leaves 8
1	from	4	leaves 3	1	from	10	leaves 9
1	from	5	leaves 4	1	from	11	leaves 10
1	from	6	leaves 5	1	from	12	leaves 11
2	from	2	leaves 0	2	from	8	leaves 6
2	from	3	leaves 1	2	from	9	leaves 7
2	from	4	leaves 2	2	from	10	leaves 8
2	from	5	leaves 3	2	from	11	leaves 9
2	from	6	leaves 4	2	from	12	leaves 10
2	from	7	leaves 5	2	from	13	leaves 11

MENTAL EXERCISES.

1. Lydia had 3 cents, but she gave 2 of them to a poor girl; how many had she left?* ANS. 1 cent.

Why 1 cent? *Because* 2 *and* 1 *more make* 3; *therefore, if we take the* 2 *from* 3, 1 *will remain.*

2. A little boy, having 4 apples, gave 2 of them to his sister; how many did he keep for himself? Why?

3. A poor woman, having 6 cents, gave 2 of them for a loaf of bread; how many has she left? Why?

4. If you should make 7 marks on your slate, and then should rub out 1, how many marks would remain? Why?

5. Albert, finding 10 ripe peaches under a tree, ate 2 of them, and carried the remainder home; how many did he carry home? Why?

* When it is required to find the difference between two numbers, the young learner may ascertain what number added to the *smaller* will make the *larger*, and that will be the answer required.

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LESSON II.

SUBTRACTION TABLE,—PART II.

3 from 3 leaves 0	3 from 9 leaves 6
3 from 4 leaves 1	3 from 10 leaves 7
3 from 5 leaves 2	3 from 11 leaves 8
3 from 6 leaves 3	3 from 12 leaves 9
3 from 7 leaves 4	3 from 13 leaves 10
3 from 8 leaves 5	3 from 14 leaves 11

4 from 4 leaves 0	4 from 10 leaves 6
4 from 5 leaves 1	4 from 11 leaves 7
4 from 6 leaves 2	4 from 12 leaves 8
4 from 7 leaves 3	4 from 13 leaves 9
4 from 8 leaves 4	4 from 14 leaves 10
4 from 9 leaves 5	4 from 15 leaves 11

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MENTAL EXERCISES.

1. Here are 5 boys playing ball, but 3 of them have no ball-clubs; how many have ball-clubs? ANS. 2 boys.

Why 2? *Because* 3 *and* 2 *more make* 5; *therefore, if we take the* 3 *from* 5, 2 *will remain.*

2. There are 5 boys and 4 girls at play in front of the school-house; how many more boys than girls are there at play? Why?

3. Amos had 3 apples when he came to school, but he has since given 3 away; how many apples has he now? Why?

4. Lucy, having 6 sheets of paper, gave 3 of them to Ann; how many did she keep for herself? Why?

5. Timothy answered 7 questions in arithmetic one day, and Francis 4; how many more did Timothy answer than Francis? Why?

6. There were 8 pigeons on a tree, but 4 flew away; how many were left? Why?

7. A tinner had 9 large milk-pans, and sold all but 3 of them; how many did he sell? Why?

8. James gave 10 cents for a book, and 4 cents less for his slate; how much did he pay for his slate? Why?

9. A boy, having 11 marbles, lost 3 of them; how many has he left? Why?

10. In a pasture there are 12 sheep; 4 of them are black, and the rest are white; how many of them are white? Why?

11. A man bought a saddle for 13 dollars, and a bridle for 3 dollars; how much more did he pay for the saddle than for the bridle? Why?

12. A cooper made 15 pails, and sold all but 4 of them; how many did he sell? Why?

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LESSON III.

SUBTRACTION TABLE,—PART III.

5 from 5 leaves 0	5 from 11 leaves 6
5 from 6 leaves 1	5 from 12 leaves 7
5 from 7 leaves 2	5 from 13 leaves 8
5 from 8 leaves 3	5 from 14 leaves 9
5 from 9 leaves 4	5 from 15 leaves 10
5 from 10 leaves 5	5 from 16 leaves 11

6 from 6 leaves 0	6 from 12 leaves 6
6 from 7 leaves 1	6 from 13 leaves 7
6 from 8 leaves 2	6 from 14 leaves 8
6 from 9 leaves 3	6 from 15 leaves 9
6 from 10 leaves 4	6 from 16 leaves 10
6 from 11 leaves 5	6 from 17 leaves 11

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MENTAL EXERCISES.

1. Here are 6 ladies and 5 gentlemen in a sail-boat; how many more ladies than gentlemen are there in the boat? ANS. 1.

Why 1? *Because* 5 *and* 1 *more make* 6; *therefore, if we take the* 5 *from* 6, 1 *will remain.*

2. This hunter has 8 dogs, but he left 6 of them at home; how many dogs has he with him? Why?

3. A man received 9 dollars for a week's work, and spent 5 dollars of it to obtain provision for his family; how many dollars had he left? Why?

4. A boy, having 10 cents, gave 6 of them for a pint of filberts, and the remainder for an orange; how many cents did he pay for the orange? Why?

5. Theron put 11 books on the table, and afterwards took away 5 of them; how many books did he leave on the table? Why?

6. If Ira should answer 12 questions at a recitation, and Oscar 6, how many more questions would Ira answer than Oscar? Why?

7. A gentleman bought 13 pounds of sugar, and after using a part of it, found that he had 5 pounds left; how many pounds had he used? Why?

8. Abner rode 15 miles in the cars, and 5 miles in a chaise; how many miles further did he ride in the cars than in the chaise? Why?

9. Stephen had 16 marbles, and lost all but 6 of them at play; how many marbles did he lose? Why?

10. Rufus caught 14 fish, and gave 5 of them to a poor woman; how many did he keep for himself? Why?

11. A pedler, having 15 penknives, sold 6 of them; how many has he left? Why?

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LESSON IV.

SUBTRACTION TABLE,—PART IV.

7 from 7 leaves 0	7 from 13 leaves 6
7 from 8 leaves 1	7 from 14 leaves 7
7 from 9 leaves 2	7 from 15 leaves 8
7 from 10 leaves 3	7 from 16 leaves 9
7 from 11 leaves 4	7 from 17 leaves 10
7 from 12 leaves 5	7 from 18 leaves 11

8 from 8 leaves 0	8 from 14 leaves 6
8 from 9 leaves 1	8 from 15 leaves 7
8 from 10 leaves 2	8 from 16 leaves 8
8 from 11 leaves 3	8 from 17 leaves 9
8 from 12 leaves 4	8 from 18 leaves 10
8 from 13 leaves 5	8 from 19 leaves 11

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MENTAL EXERCISES.

1. A farmer has 8 horses in one pasture, and 7 in another; how many more has he in one pasture than the other? ANS. 1.

Why 1? *Because* 7 *and* 1 *more make* 8; *therefore, if we take the* 7 *from* 8, 1 *will remain.*

2. Simeon gave 10 cents for his hoop, and Oliver gave 8 cents for his; how much more did Simeon's hoop cost than Oliver's? Why?

3. There were 12 white roses on a bush, but a little girl picked 7 of them; how many were left on the bush? Why?

4. A man had 13 dollars, and paid all but 5 dollars for a plow; how many dollars did he pay for the plow? Why?

5. Edgar had 14 young ducks, but the rain killed 7 of them; how many has he now? Why?

6. There are 15 yards in a piece of silk. If a lady should purchase 8 yards of it for a dress, how many yards would be left? Why?

7. A boy had 7 oranges, and his father gave him enough more to make 16; how many oranges did his father give him? Why?

8. In a class of 17 scholars, only 8 recited perfect lessons; how many had imperfect lessons? Why?

9. Calvin carried 18 quarts of strawberries to market, and sold all but 7 quarts; how many quarts did he sell? Why?

10. A young lady went a shopping with 19 dollars, and on her return she had 8 dollars left; how many dollars did she spend? Why?

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LESSON V.

SUBTRACTION TABLE, — PART V.

9 from 9 leaves 0	9 from 15 leaves 6
9 from 10 leaves 1	9 from 16 leaves 7
9 from 11 leaves 2	9 from 17 leaves 8
9 from 12 leaves 3	9 from 18 leaves 9
9 from 13 leaves 4	9 from 19 leaves 10
9 from 14 leaves 5	9 from 20 leaves 11

10 from 10 leaves 0	10 from 16 leaves 6
10 from 11 leaves 1	10 from 17 leaves 7
10 from 12 leaves 2	10 from 18 leaves 8
10 from 13 leaves 3	10 from 19 leaves 9
10 from 14 leaves 4	10 from 20 leaves 10
10 from 15 leaves 5	10 from 21 leaves 11

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MENTAL EXERCISES.

1. Robert has a globe that is worth 12 shillings, and Gideon a book worth 9 shillings; how much more is the globe worth than the book? ANS. 3 shillings.

Why 3 shillings? *Because 9 shillings and 3 shillings more make 12 shillings; therefore, if we take the 9 shillings from 12 shillings, 3 shillings will remain.*

2. Laura received 13 credit-marks for good lessons during the last week, and Olive 10; how many more credit-marks did Laura receive than Olive? Why?

3. There were 11 weeks in the last term, and Timothy attended the school only 9 weeks; how many weeks was he absent? Why?

4. Caroline has written 14 compositions, and Frances 9; how many more compositions has Caroline written than Frances? Why?

5. Austin, having 15 steel pens in a box, gave away to his classmates all but 10 of them; how many pens did he give away? Why?

6. Emma found 17 strawberries on her way to school, and gave 10 of them to her sister; how many did she keep for herself? Why?

7. James sold his colt for 18 dollars, and received in payment 9 dollars' worth of goods, and the rest in money; how much money did he receive? Why?

8. A painter bought 19 gallons of oil, and after using 10 gallons of it, sold the remainder; how many gallons did he sell? Why?

9. A man borrowed 20 dollars in money, and soon after paid 9 dollars of it; how many dollars are still due? Why?

10. A farmer, having 10 sheep, bought enough to make 21; how many sheep did he buy? Why?

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LESSON VI.

SUBTRACTION TABLE,—PART VI.

11 from 11 leaves 0	11 from 17 leaves 6
11 from 12 leaves 1	11 from 18 leaves 7
11 from 13 leaves 2	11 from 19 leaves 8
11 from 14 leaves 3	11 from 20 leaves 9
11 from 15 leaves 4	11 from 21 leaves 10
11 from 16 leaves 5	11 from 22 leaves 11

12 from 12 leaves 0	12 from 18 leaves 6
12 from 13 leaves 1	12 from 19 leaves 7
12 from 14 leaves 2	12 from 20 leaves 8
12 from 15 leaves 3	12 from 21 leaves 9
12 from 16 leaves 4	12 from 22 leaves 10
12 from 17 leaves 5	12 from 23 leaves 11

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MENTAL EXERCISES.

1. In this poultry-yard, a hen has 12 chickens, and a goose has 11 goslings; how many more chickens than goslings are there? ANS. 1.

Why 1? *Because* 11 *and* 1 *more make* 12; *therefore, if we take the* 11 *from* 12, 1 *will remain.*

2. If you had 14 turkeys, and should sell 12 of them, how many turkeys would you have left? Why?

3. Calvin had 14 ducks, but he gave 11 of them for a peacock; how many ducks has he now? Why?

4. A boy carried 15 chickens to market, and sold 12 of them to an innkeeper, and the remainder to a bookseller; how many chickens did he sell to the bookseller? Why?

5. A man bought a cow for 12 dollars, and sold her for 17 dollars; how many dollars did he gain by his bargain? Why?

6. A grocer, having 19 boxes of lemons, sold 12 boxes; how many boxes has he left? Why?

7. There are 20 men and 11 boys at work in one book-bindery; how many more men than boys are there? Why?

8. Emeline bought 21 yards of lace, and gave 12 yards of it to her sisters; how many yards did she keep for herself? Why?

9. Alanson gave 22 cents for a book, and 11 cents for a quire of paper; how much more did he pay for the book than for the paper? Why?

10. A man, having 23 dollars due him, received in payment two cords of wood, worth 12 dollars, and the remainder in money; how much money did he receive? Why?

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LESSON VII.

MISCELLANEOUS REVIEW.

1. 2 from 9 leaves how many?
2. 2 from 11 leaves how many?
3. 2 from 10 leaves how many?
4. 2 from 12 leaves how many?
5. 3 from 9 leaves how many?
6. 3 from 8 leaves how many?
7. 3 from 10 leaves how many?
8. 3 from 12 leaves how many?
9. 3 from 11 leaves how many?
10. 3 from 13 leaves how many?
11. 4 from 11 leaves how many?
12. 4 from 10 leaves how many?
13. 4 from 13 leaves how many?
14. 4 from 12 leaves how many?
15. 4 from 14 leaves how many?
16. 5 from 10 leaves how many?
17. 5 from 12 leaves how many?
18. 5 from 11 leaves how many?
19. 5 from 14 leaves how many?
20. 5 from 13 leaves how many?
21. 5 from 15 leaves how many?
22. 6 from 11 leaves how many?
23. 6 from 13 leaves how many?
24. 6 from 12 leaves how many?
25. 6 from 15 leaves how many?
26. 6 from 14 leaves how many?
27. 6 from 16 leaves how many?
28. 7 from 12 leaves how many?
29. 7 from 14 leaves how many?
30. 7 from 13 leaves how many?

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LESSON VIII.

MISCELLANEOUS REVIEW.

1. 7 from 16 leaves how many?
2. 7 from 15 leaves how many?
3. 7 from 17 leaves how many?
4. 8 from 13 leaves how many?
5. 8 from 15 leaves how many?
6. 8 from 14 leaves how many?
7. 8 from 17 leaves how many?
8. 8 from 16 leaves how many?
9. 8 from 18 leaves how many?
10. 9 from 14 leaves how many?
11. 9 from 16 leaves how many?
12. 9 from 15 leaves how many?
13. 9 from 18 leaves how many?
14. 9 from 17 leaves how many?
15. 9 from 19 leaves how many?
16. 10 from 15 leaves how many?
17. 10 from 17 leaves how many?
18. 10 from 16 leaves how many?
19. 10 from 19 leaves how many?
20. 10 from 18 leaves how many?
21. 10 from 20 leaves how many?
22. 11 from 16 leaves how many?
23. 11 from 18 leaves how many?
24. 11 from 17 leaves how many?
25. 11 from 20 leaves how many?
26. 11 from 19 leaves how many?
27. 11 from 21 leaves how many?
28. 12 from 17 leaves how many?
29. 12 from 19 leaves how many?
30. 12 from 18 leaves how many?

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LESSON IX.

MISCELLANEOUS REVIEW.

1. 5 and 4, less 6, are how many? ANS. 3.
Why 3? *Because* 5 *and* 4 *more make* 9, *and* 6 *from* 9 *leaves* 3.

2. 7 and 3, less 5, are how many?
3. 5 and 4, less 2, are how many?
4. 6 and 6, less 7, are how many?
5. 7 and 4, less 8, are how many?
6. 8 and 2, less 6, are how many?
7. 9 and 3, less 5, are how many?
8. 7 and 6, less 8, are how many?
9. 8 and 7, less 4, are how many?
10. 9 and 5, less 7, are how many?
11. 8 and 8, less 6, are how many?
12. 9 and 6, less 8, are how many?
13. 9 and 7, less 5, are how many?
14. 8 and 6, less 9, are how many?
15. 9 and 9, less 6, are how many?
16. 9 and 8, less 7, are how many?
17. 10 and 8, less 4, are how many?
18. 11 and 6, less 8, are how many?
19. 10 and 5, less 3, are how many?
20. 12 and 8, less 5, are how many?
21. 11 and 8, less 6, are how many?
22. 10 and 7, less 3, are how many?
23. 12 and 9, less 4, are how many?
24. 11 and 8, less 10, are how many?
25. 10 and 9, less 11, are how many?
26. 12 and 11, less 10, are how many?
27. 11 and 11, less 12, are how many?
28. 10 and 10, less 11, are how many?

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LESSON X.

MISCELLANEOUS REVIEW.

1. A man, having 12 bushels of quinces, sold at one time 5 bushels, and at another 4 bushels? How many bushels had he left? ANS. 3 bushels.

Why 3? *Because* 5 *and* 4 *more make* 9, *and* 9 *from* 12 *leaves* 3.

2. John had 15 pears, and he gave 6 to Cyrus, and 5 to Ralph; how many had he left? Why?

3. There are 20 vessels anchored in a harbor; 7 of them are barks, 5 are ships, and the rest are brigs and schooners; how many brigs and schooners are there? Why?

4. Thomas gave 11 cents for a top, and 6 cents for a string to spin it with, and then sold them both for 21 cents; how many cents did he gain by his bargain? Why?

5. A grocer sold a chest of tea for 25 dollars, and took in payment 12 dollars' worth of wheat, 8 dollars' worth of oats, and the remainder in money; how much money did he receive? Why?

6. There were 30 gallons of oil in a cask; 15 gallons were sold, and 5 gallons leaked out; how many gallons remained in the cask? Why?

7. A gentleman, having 24 canary birds in twelve cages, sold 9 of them, and lost 5 more; how many has he left? Why?

8. A man bought a wagon for 40 dollars, paid 10 dollars for having it painted, and then sold it for 60 dollars; did he gain or lose by his bargain, and how much? Why?

9. How many are 60 and 40, less 20?

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MULTIPLICATION.

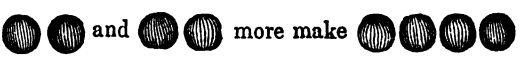
LESSON I.

MULTIPLICATION means a short process of adding any given number or thing to itself a certain number of times; thus we say,

1. 1 acorn and 1 acorn more make 2 acorns,

or, by multiplication, 2 times 1 acorn are 2 acorns.

2. 2 oranges and 2 oranges more make 4 oranges,



or, by multiplication, 2 times 2 oranges are 4 oranges.

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MULTIPLICATION TABLE,—PART I.

Once	1	is	1	Once	7	is	7
Once	2	is	2	Once	8	is	8
Once	3	is	3	Once	9	is	9
Once	4	is	4	Once	10	is	10
Once	5	is	5	Once	11	is	11
Once	6	is	6	Once	12	is	12

2 times	1	are	2	2 times	7	are	14
2 times	2	are	4	2 times	8	are	16
2 times	3	are	6	2 times	9	are	18
2 times	4	are	8	2 times	10	are	20
2 times	5	are	10	2 times	11	are	22
2 times	6	are	12	2 times	12	are	24

MENTAL EXERCISES.

1. Esther has 2 primers that cost 2 cents apiece; how many cents did they both cost? ANS. 4 cents.

Why 4 cents? *Because, if* 1 *primer cost* 2 *cents,* 2 *primers will cost* 2 *times* 2 *cents;* 2 *times* 2 *cents are* 4 *cents. Therefore, the* 2 *primers cost* 4 *cents.*

2. Susan gave 2 little girls 3 apples apiece; how many apples did she give them both? Why?

3. Almira bought 2 yards of tape, at 4 cents a yard; how many cents did she pay for it? Why?

4. How many cents must you pay for 2 pounds of rice, at 6 cents a pound? Why?

5. How many pages would you read in 2 days, if you should read 5 pages each day? Why? How many, if you should read 7 pages? Why?

6. What will 2 slates cost, at 9 cents apiece? Why? At 11 cents apiece? Why? At 10 cents apiece? Why? At 12 cents apiece? Why?

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LESSON II.

MULTIPLICATION TABLE, — PART II.

3 times 1 are 3	3 times 7 are 21
3 times 2 are 6	3 times 8 are 24
3 times 3 are 9	3 times 9 are 27
3 times 4 are 12	3 times 10 are 30
3 times 5 are 15	3 times 11 are 33
3 times 6 are 18	3 times 12 are 36

4 times 1 are 4	4 times 7 are 28
4 times 2 are 8	4 times 8 are 32
4 times 3 are 12	4 times 9 are 36
4 times 4 are 16	4 times 10 are 40
4 times 5 are 20	4 times 11 are 44
4 times 6 are 24	4 times 12 are 48

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MENTAL EXERCISES.

1. If Edwin should feed his lamb with 2 quarts of milk each day, how many quarts will he feed him in 3 days? ANS. 6 quarts.

Why 6 quarts? *Because, if he feed him* 2 *quarts in* 1 *day, in* 3 *days he will feed him* 3 *times* 2 *quarts; 3 times* 2 *quarts are* 6 *quarts. Therefore, in* 3 *days he would feed his lamb* 6 *quarts.*

2. If a drover pay 3 dollars a head for sheep, how much will he pay for 3 sheep? Why? How much for 4 sheep, at the same price? Why?

3. At 5 shillings a bushel, what will 3 bushels of corn cost? Why? What will 4 bushels cost? Why?

4. What will 4 yards of ribbon cost, at 4 cents a yard? Why? What will 3 yards cost? Why?

5. When sugar is worth 7 cents a pound, what will 3 pounds cost? What will 4 pounds cost? Why?

6. If you buy oranges at 6 cents apiece, how many cents must you pay for 3 oranges? Why? How many for 4? Why?

7. At 8 shillings a yard, what will 3 yards of silk come to? Why? 4 yards? Why?

8. A man paid 9 dollars a ton for hay; how much did he pay for 3 tons? How much for 4 tons? Why?

9. In one cent there are 10 mills; how many mills in 3 cents? Why? In 4 cents? Why?

10. If a man earn 11 dollars in a week, how many dollars will he earn in 3 weeks? In 4 weeks? Why?

11. In one shilling there are 12 pence; how many pence in 4 shillings? Why? In 3 shillings? Why?

12. Which is the most, 3 times 4, or 4 times 3?

13. Which is the most, 2 times 9, or 3 times 6?

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LESSON III.

MULTIPLICATION TABLE,—PART III.

5 times 1 are 5	5 times 7 are 35
5 times 2 are 10	5 times 8 are 40
5 times 3 are 15	5 times 9 are 45
5 times 4 are 20	5 times 10 are 50
5 times 5 are 25	5 times 11 are 55
5 times 6 are 30	5 times 12 are 60

6 times 1 are 6	6 times 7 are 42
6 times 2 are 12	6 times 8 are 48
6 times 3 are 18	6 times 9 are 54
6 times 4 are 24	6 times 10 are 60
6 times 5 are 30	6 times 11 are 66
6 times 6 are 36	6 times 12 are 72

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MENTAL EXERCISES.

1. If a man can cradle 3 acres of wheat in one day, how many acres can he cradle in 5 days.

ANS. 15 acres.

Why 15 acres? *Because, if he can cradle* 3 *acres in* 1 *day, in* 5 *days he can cradle* 5 *times* 3 *acres;* 5 *times* 3 *acres are* 15 *acres. Therefore, in* 5 *days he can cradle* 15 *acres.*

2. At 2 dollars a day, how much will a man earn in 5 days? Why? In 6 days? Why?

3. What will 5 barrels of flour cost, at 4 dollars a barrel? What will 6 barrels cost? Why?

4. If a horse travel 6 miles in an hour, how far will he travel in 5 hours? In 6 hours? Why?

5. A farmer bought a plow for 5 dollars; what would 5 plows cost, at the same rate? What would 6 plows cost? Why?

6. There are 7 days in a week; how many days in 5 weeks? In 6 weeks? Why?

7. What will 5 yards of satinet cost, at 7 shillings a yard? What will 6 yards cost? Why?

8. At 8 cents apiece, how much will 5 melons come to? How much will 6 melons come to? Why?

9. How far will a boat sail in 5 hours, at the rate of 9 miles an hour? How far in 6 hours? Why?

10. When hay is worth 10 dollars a ton, what will 5 tons cost? What will 6 tons cost? Why?

11. How many yards are there in 5 pieces of cloth, there being 12 yards in each piece? How many yards in 6 pieces? Why?

12. How much will 5 pounds of honey cost, at 11 cents a pound? How much will 6 pounds cost? Why?

13. Which is the most, 6 times 6 or 4 times 9?

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LESSON IV.

MULTIPLICATION TABLE, — PART IV.

7 times 1 are 7	7 times 7 are 49
7 times 2 are 14	7 times 8 are 56
7 times 3 are 21	7 times 9 are 63
7 times 4 are 28	7 times 10 are 70
7 times 5 are 35	7 times 11 are 77
7 times 6 are 42	7 times 12 are 84

8 times 1 are 8	8 times 7 are 56
8 times 2 are 16	8 times 8 are 64
8 times 3 are 24	8 times 9 are 72
8 times 4 are 32	8 times 10 are 80
8 times 5 are 40	8 times 11 are 88
8 times 6 are 48	8 times 12 are 96

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MENTAL EXERCISES.

1. Milford bought 7 oranges, at 3 cents apiece; how many cents did they cost him? ANS. 21 cents.

Why 21 cents? *Because, if* 1 *orange cost* 3 *cents*, 7 *oranges will cost* 7 *times* 3 *cents; 7 times* 3 *cents are* 21 *cents. Therefore, the* 7 *oranges cost him* 21 *cents.*

2. If a market-woman receive 2 dollars a day for fruit, how many dollars will she receive in 7 days? Why? In 8 days? Why?

3. Elias paid 4 shillings for a knife; what would 7 knives cost, at the same rate? What would 8 knives cost? Why?

4. When Daniel uses 6 sheets of paper in a week, how many sheets will he use in 7 weeks? How many in 8 weeks? Why?

5. What will 7 hats cost, at 5 dollars apiece? What will 8 hats cost, at the same price? Why?

6. If a mill grind 7 bushels of wheat in one hour, how many bushels will it grind in 7 hours? How many in 8 hours? Why?

7. In one square yard there are 9 square feet; how many square feet are there in 7 square yards? In 8 square yards? Why?

8. If you write 8 lines each day, how many lines will you write in 7 days? In 8 days? Why?

9. When coffee is worth 10 cents a pound, how much must you pay for 7 pounds? How much for 8 pounds? Why?

10. At 12 dollars a month, how much will a man earn in 7 months? In 8 months? Why?

11. How many are 7 times 11? 7 times 12?

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LESSON V.

MULTIPLICATION TABLE,—PART V.

9	times	1	are	9	9	times	7	are	63
9	times	2	are	18	9	times	8	are	72
9	times	3	are	27	9	times	9	are	81
9	times	4	are	36	9	times	10	are	90
9	times	5	are	45	9	times	11	are	99
9	times	6	are	54	9	times	12	are	108

10	times	1	are	10	10	times	7	are	70
10	times	2	are	20	10	times	8	are	80
10	times	3	are	30	10	times	9	are	90
10	times	4	are	40	10	times	10	are	100
10	times	5	are	50	10	times	11	are	110
10	times	6	are	60	10	times	12	are	120

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MENTAL EXERCISES.

1. Melinda has a picture-book, that cost 4 cents; what will 9 such books cost? ANS. 36 cents.

Why 36 cents? *Because, if* 1 *book cost* 4 *cents*, 9 *books will cost* 9 *times* 4 *cents;* 9 *times* 4 *cents are* 36 *cents. Therefore*, 9 *such books will cost* 36 *cents.*

2. How many cents must you pay for 9 yards of ribbon, at 2 cents a yard? Why? How many cents for 10 yards? Why?

3. What cost 9 lambs, at 5 shillings a head? What cost 10 lambs, at the same rate? Why?

4. At 3 cents a skein, what will 9 skeins of sewing-silk cost? What will 10 skeins cost? Why?

5. If you recite 6 perfect lessons every week, how many perfect lessons will you recite in 9 weeks? In 10 weeks? Why?

6. In New York, 8 shillings make a dollar; how many shillings are there in 9 dollars? How many in 10 dollars? Why?

7. If 7 yards of calico will make one dress, how many yards will make 9 dresses? How many yards will make 10 dresses? Why?

8. How much will 9 pounds of sugar cost, at 9 cents a pound? How much will 10 pounds cost, at the same price? Why?

9. There are 10 dollars in one eagle; how many dollars are there in 9 eagles? In 10 eagles? Why?

10. At 12 dollars a firkin, how much must be paid for 9 firkins of butter? For 10 firkins? Why?

11. What is the value of 9 acres of land, at 11 dollars an acre? Of 10 acres? Why?

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LESSON VI.

MULTIPLICATION TABLE, — PART VI.

11	times	1	are 11	11	times	7	are 77
11	times	2	are 22	11	times	8	are 88
11	times	3	are 33	11	times	9	are 99
11	times	4	are 44	11	times	10	are 110
11	times	5	are 55	11	times	11	are 121
11	times	6	are 66	11	times	12	are 132

12	times	1	are 12	12	times	7	are 84
12	times	2	are 24	12	times	8	are 96
12	times	3	are 36	12	times	9	are 108
12	times	4	are 48	12	times	10	are 120
12	times	5	are 60	12	times	11	are 132
12	times	6	are 72	12	times	12	are 144

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MENTAL EXERCISES.

1. If Sophia's muff cost 2 dollars, what will 11 such muffs cost? ANS. 22 dollars.

Why 22 dollars? *Because, if one muff cost 2 dollars, 11 muffs will cost 11 times 2 dollars; 11 times 2 dollars are 22 dollars. Therefore, 11 such muffs will cost 22 dollars.*

2. How much must I pay for 11 books, at 3 dollars apiece? Why? How much for 12 books, at the same price? Why?

3. At 4 dollars apiece, what will 11 Leghorn bonnets cost? What will 12 cost? Why?

4. If a stage run 6 miles in one hour, how far will it run in 11 hours? In 12 hours? Why?

5. Ellen paid 5 shillings for a pair of shoes; what will 11 pairs cost, at the same price? What will 12 pairs cost? Why?

6. At 7 cents a quart, how many cents must be paid for 11 quarts of blackberries? How many for 12 quarts? Why?

7. What cost 11 bushels of wheat, at 9 shillings a bushel? What cost 12 bushels? Why?

8. If 8 yards of broadcloth will make one suit of clothes, how many yards will make 11 suits? How many will make 12 suits? Why?

9. If a weaver can weave 10 yards in one day, how many yards can he weave in 11 days? In 12 days? Why?

10. If you should answer 12 questions at every recitation, how many questions would you answer at 11 recitations? At 12 recitations? Why?

11. Which is most, 8 times 9, or 6 times 12?

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LESSON VII.

MISCELLANEOUS REVIEW.

1.	2	times	4	are	how	many?
2.	2	times	3	are	how	many?
3.	2	times	5	are	how	many?
4.	2	times	7	are	how	many?
5.	2	times	6	are	how	many?
6.	2	times	9	are	how	many?
7.	2	times	8	are	how	many?
8.	2	times	11	are	how	many?
9.	2	times	10	are	how	many?
10.	2	times	12	are	how	many?
11.	3	times	5	are	how	many?
12.	3	times	4	are	how	many?
13.	3	times	6	are	how	many?
14.	3	times	8	are	how	many?
15.	3	times	7	are	how	many?
16.	3	times	9	are	how	many?
17.	3	times	11	are	how	many?
18.	3	times	10	are	how	many?
19.	3	times	12	are	how	many?
20.	4	times	6	are	how	many?
21.	4	times	5	are	how	many?
22.	4	times	7	are	how	many?
23.	4	times	9	are	how	many?
24.	4	times	8	are	how	many?
25.	4	times	11	are	how	many?
26.	4	times	10	are	how	many?
27.	4	times	12	are	how	many?
28.	5	times	7	are	how	many?
29.	5	times	9	are	how	many?
30.	5	times	8	are	how	many?

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LESSON VIII.

MISCELLANEOUS REVIEW.

1. 5 times 11 are how many?
2. 5 times 10 are how many?
3. 5 times 12 are how many?
4. 6 times 6 are how many?
5. 6 times 8 are how many?
6. 6 times 7 are how many?
7. 6 times 9 are how many?
8. 6 times 11 are how many?
9. 6 times 10 are how many?
10. 6 times 12 are how many?
11. 7 times 7 are how many?
12. 7 times 9 are how many?
13. 7 times 8 are how many?
14. 7 times 11 are how many?
15. 7 times 10 are how many?
16. 7 times 12 are how many?
17. 8 times 9 are how many?
18. 8 times 8 are how many?
19. 8 times 11 are how many?
20. 8 times 10 are how many?
21. 8 times 12 are how many?
22. 9 times 9 are how many?
23. 9 times 11 are how many?
24. 9 times 10 are how many?
25. 9 times 12 are how many?
26. 10 times 11 are how many?
27. 10 times 10 are how many?
28. 10 times 12 are how many?
29. 11 times 12 are how many?
30. 12 times 12 are how many?

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LESSON IX.

MISCELLANEOUS REVIEW.

1. 4 and 3, less 5, multiplied by 2, are how many?

ANS. 4.

Why 4? *Because* 4 *and* 3 *more make* 7, *and* 5 *from* 7 *leaves* 2, *and* 2 *times* 2 *are four.*

2. 5 and 4, less 3, multiplied by 2, are how many?
3. 6 and 5, less 4, multiplied by 3, are how many?
4. 7 and 6, less 5, multiplied by 4, are how many?
5. 8 and 7, less 6, multiplied by 5, are how many?
6. 9 and 8, less 7, multiplied by 6, are how many?
7. 9 and 9, less 8, multiplied by 7, are how many?
8. 11, and 7, and 3, less 9, multiplied by 8, are how many?
9. 11, and 6, and 5, less 10, multiplied by 9, are how many?
10. 12, and 5, and 4, less 11, multiplied by 10, are how many?
11. 11, and 6, and 2, less 9, multiplied by 7, are how many?
12. 10, and 4, and 3, less 8, multiplied by 9, are how many?
13. 11, and 7, and 2, less 12, multiplied by 8, are how many?
14. 12, and 3, and 2, less 6, multiplied by 11, are how many?
15. 10, and 4, and 2, less 4, multiplied by 12, are how many?
16. 11, and 7, and 5, less 12, multiplied by 3 times 3, are how many?
17. 12, and 6, and 3, less 9, multiplied by 2 times 3, are how many?

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LESSON X.

MISCELLANEOUS REVIEW.

1. Albert bought 3 pounds of almonds, at 8 cents a pound, and 2 oranges, at 5 cents apiece; what was the cost of the whole? ANS. 34 cents.

Why 34 cents? *Because* 3 *pounds of almonds, at* 8 *cents a pound, will cost* 24 *cents, and* 2 *oranges, at* 5 *cents apiece, will cost* 10 *cents;* 24 *cents and* 10 *cents more make* 34 *cents. Therefore, the cost of the whole was* 34 *cents.*

2. At 5 dollars apiece, what is the value of 4 satin vests? Of 6? Of 5? Of 7? Of 9? Why?

3. Which is the most, 6 times 8, or 5 times 9? 7 times 10, or 11 times 7? Why?

4. How many are 6 times 12, less 10? 8 times 7, less 6? 5 times 11, less 9? Why?

5. A man bought 6 brooms, at 2 shillings apiece, and 8 hair-brushes, at 4 shillings apiece; what was the whole cost? Why?

6. At 3 dollars a day, how much will a man earn in 4 days? In 6 days? In 5 days? In 7 days? In 9 days? In 8 days? Why?

7. Peter sold a kite for 30 cents, and received in payment 3 quarts of chestnuts, at 8 cents a quart, and the remainder in money; how much money did he receive? Why?

8. If one ream of paper cost 5 dollars, what will 4 reams cost? What will 6 reams cost? 8 reams? 10 reams? 12 reams? Why?

9. There is an orchard consisting of 6 rows of trees, and there are 10 trees in each row; how many trees are there in the orchard? Why?

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DIVISION.

LESSON I.

DIVISION means separating numbers into parts, or finding how many times one number or quantity is contained in another; thus we say,

1. Since 2 times (1 plum) are equal to (2 plums),
therefore, 1 is contained in 2, 2 times.

2. Since 2 times (2 hats) are equal to (4 hats),
therefore, 2 is contained in 4, 2 times.

3. Since 3 times 2 pins are equal to 6 pins, therefore, 2 is contained in 6, 3 times.

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DIVISION TABLE,—PART I.

1	in	1,	1 time	1	in	7,	7 times
1	in	2,	2 times	1	in	8,	8 times
1	in	3,	3 times	1	in	9,	9 times
1	in	4,	4 times	1	in	10,	10 times
1	in	5,	5 times	1	in	11,	11 times
1	in	6,	6 times	1	in	12,	12 times

2	in	2,	1 time	2	in	14,	7 times
2	in	4,	2 times	2	in	16,	8 times
2	in	6,	3 times	2	in	18,	9 times
2	in	8,	4 times	2	in	20,	10 times
2	in	10,	5 times	2	in	22,	11 times
2	in	12,	6 times	2	in	24,	12 times

MENTAL EXERCISES.

1. This market-man divided 6 plums equally between 2 little girls; how many did he give to each?*

ANS. 3 plums.

Why 3? *Because, if he divided* 6 *plums equally between the* 2 *girls, he must have given to each one as many plums as* 2 *is contained times in* 6; 2 *in* 6, 3 *times, since* 3 *times* 2 *are* 6. *Therefore, he gave them* 3 *plums apiece.*

2. This same man divided 4 peaches equally between 2 little boys; how many did he give them apiece? Why?

3. At 2 cents apiece, how many apples can you buy for 8 cents? For 10 cents? For 12 cents? Why?

* When it is required to find how many times one number is contained in another, the pupil may ascertain, by multiplication, how many times the *smaller* number will make the *larger*, and that will be the required answer.

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LESSON II.

DIVISION TABLE, — PART II.

3 in 3, 1 time	3 in 21, 7 times
3 in 6, 2 times	3 in 24, 8 times
3 in 9, 3 times	3 in 27, 9 times
3 in 12, 4 times	3 in 30, 10 times
3 in 15, 5 times	3 in 33, 11 times
3 in 18, 6 times	3 in 36, 12 times

4 in 4, 1 time	4 in 28, 7 times
4 in 8, 2 times	4 in 32, 8 times
4 in 12, 3 times	4 in 36, 9 times
4 in 16, 4 times	4 in 40, 10 times
4 in 20, 5 times	4 in 44, 11 times
4 in 24, 6 times	4 in 48, 12 times

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MENTAL EXERCISES.

1. Here are 6 boys with a kite; how many times 3 boys are there? ANS. 2 times.

Why 2 times? *Because there will be as many times* 3 *boys as* 3 *is contained times in* 6; 3 *in* 6, 2 *times. Therefore* 6 *boys are* 2 *times* 3 *boys.*

2. Jane divided 8 peaches equally among 4 of her companions; how many did she give to each? Why?

3. At 3 cents a quart, how many quarts of cherries can you buy for 9 cents? Why? How many for 12 cents? Why?

4. How many hats, at 4 dollars apiece, can you buy for 12 dollars? How many for 16 dollars? Why?

5. When lemons are 3 cents apiece, how many can be bought for 15 cents? Why? How many for 18 cents? Why?

6. If you walk 4 miles an hour, how many hours will it take you to walk 20 miles? Why? How many to walk 24 miles? Why?

7. There are 3 feet in a yard; how many yards are there in 21 feet? Why? In 27 feet? Why?

8. At 4 dollars a cord, how many cords of wood can be bought for 28 dollars? Why? How many for 32 dollars? Why?

9. A gentleman divided 30 cents equally among 3 children; how many did each one receive? Why?

10. A class of 3 boys answered 33 questions in arithmetic, each an equal number; how many questions did each one answer? Why?

11. There are 4 quarts in a gallon; how many gallons in 36 quarts? Why? In 44 quarts? Why? In 40 quarts? Why? In 48 quarts? Why?

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LESSON III.

DIVISION TABLE,—PART III.

5 in 5, 1 time	5 in 35, 7 times
5 in 10, 2 times	5 in 40, 8 times
5 in 15, 3 times	5 in 45, 9 times
5 in 20, 4 times	5 in 50, 10 times
5 in 25, 5 times	5 in 55, 11 times
5 in 30, 6 times	5 in 60, 12 times

6 in 6, 1 time	6 in 42, 7 times
6 in 12, 2 times	6 in 48, 8 times
6 in 18, 3 times	6 in 54, 9 times
6 in 24, 4 times	6 in 60, 10 times
6 in 30, 5 times	6 in 66, 11 times
6 in 36, 6 times	6 in 72, 12 times

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MENTAL EXERCISES.

1. If 6 ladies and gentlemen can ride in one carriage, how many carriages will accommodate 12 ladies and gentlemen? ANS. 2 carriages.

Why 2 carriages? *Because, if only* 6 *ladies and gentlemen can ride in* 1 *carriage, it will require as many carriages for* 12 *ladies and gentlemen to ride in as* 6 *is contained times in* 12; 6 *in* 12, 2 *times. Therefore, it will require* 2 *carriages.*

2. Harriet paid 5 cents a yard for silk braid; how many yards could she buy for 10 cents? Why? For 20 cents? Why? For 15 cents? Why?

3. When lard is 6 cents a pound, how many pounds can be bought for 18 cents? For 28 cents? For 24 cents? Why?

4. A man has 30 dollars, which he wishes to lay out in flour, at 5 dollars a barrel; how many barrels can he buy? If he had 40 dollars, how many barrels could he buy? Why?

5. How many tons of coal, at 6 dollars a ton, can a blacksmith purchase for 30 dollars? For 42 dollars? For 36 dollars? Why?

6. At 5 cents a quart, how many quarts of milk can you buy for 35 cents? For 45 cents? Why?

7. In New England, 6 shillings make a dollar; how many dollars are there in 48 shillings? In 54 shillings? In 60 shillings? Why?

8. How many spools of thread, at 5 cents apiece, can you obtain for 50 cents? For 60 cents? For 55 cents? Why?

9. When bonnets are 6 dollars apiece, how many can be bought for 54 dollars? For 66 dollars? For 72 dollars? Why?

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LESSON IV.

DIVISION TABLE,—PART IV.

7 in 7, 1 time	7 in 49, 7 times
7 in 14, 2 times	7 in 56, 8 times
7 in 21, 3 times	7 in 63, 9 times
7 in 28, 4 times	7 in 70, 10 times
7 in 35, 5 times	7 in 77, 11 times
7 in 42, 6 times	7 in 84, 12 times

8 in 8, 1 time	8 in 56, 7 times
8 in 16, 2 times	8 in 64, 8 times
8 in 24, 3 times	8 in 72, 9 times
8 in 32, 4 times	8 in 80, 10 times
8 in 40, 5 times	8 in 88, 11 times
8 in 48, 6 times	8 in 96, 12 times

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MENTAL EXERCISES.

1. Seth sold his wagon for 21 cents; how many slates can he buy with the money, at 7 cents apiece?

ANS. 3 slates.

Why 3 slates? *Because, if he pay 7 cents apiece, he can buy as many slates for 21 cents as 7 cents are contained times in 21 cents; 7 cents in 21 cents, 3 times, since 3 times 7 are 21. Therefore, he can buy 3 slates.*

2. Levi paid 7 cents for his ball; how many balls can he buy for 14 cents, at the same price? Why? How many for 28 cents? Why?

3. If Giles can buy a hoop for 8 cents, how many hoops can he buy for 16 cents? For 32 cents? For 24 cents? Why?

4. If it take 7 yards to make one dress for a girl, how many dresses can be made from 35 yards? From 42 yards? Why?

5. How many bins will be required to contain 48 bushels of wheat, if each bin contain 8 bushels? How many bins to contain 40 bushels? Why?

6. At 7 dollars a ton, how many tons of hay can I buy for 49 dollars? For 63 dollars? For 56 dollars? Why?

7. If there are 8 trees in each row, how many rows are there in an orchard consisting of 64 trees? How many in an orchard consisting of 56 trees? Why?

8. In one week there are 7 days; how many weeks are there in 70 days? In 84 days? In 77 days? Why?

9. How many books can you buy for 72 cents, at 8 cents apiece? How many for 88 cents? For 80 cents? For 96 cents? Why?

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LESSON V.

DIVISION TABLE, — PART V.

9	in	9,	1	time	9	in	63,	7	times
9	in	18,	2	times	9	in	72,	8	times
9	in	27,	3	times	9	in	81,	9	times
9	in	36,	4	times	9	in	90,	10	times
9	in	45,	5	times	9	in	99,	11	times
9	in	54,	6	times	9	in	108,	12	times

10	in	10,	1	time	10	in	70,	7	times
10	in	20,	2	times	10	in	80,	8	times
10	in	30,	3	times	10	in	90,	9	times
10	in	40,	4	times	10	in	100,	10	times
10	in	50,	5	times	10	in	110,	11	times
10	in	60,	6	times	10	in	120,	12	times

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MENTAL EXERCISES.

1. If James should read 9 pages in his library-book each day, how long would it take him to read 36 pages? ANS. 4 days.

Why 4 days? *Because, if he read* 9 *pages in* 1 *day, it will take him as many days to read* 36 *pages as* 9 *is contained times in* 36; 9 *in* 36, 4 *times, since* 4 *times* 9 *are* 36. *Therefore, he will read* 36 *pages in* 4 *days.*

2. A class of 10 scholars performed 20 questions in arithmetic, at one recitation; how many questions was that apiece? Why?

3. How many classes, of 9 scholars each, can be formed from 27 scholars? From 18 scholars? From 45 scholars? Why?

4. At 10 shillings apiece, how many glass lamps can be bought for 30 shillings? For 50 shillings? For 40 shillings? Why?

5. When butter is 9 cents a pound, how many pounds can you buy for 54 cents? For 72 cents? For 63 cents? Why?

6. How many shawls can I buy for 60 dollars, when they are worth 10 dollars apiece? How many for 80 dollars? For 70 dollars? For 90 dollars? For 110 dollars? For 100 dollars? Why?

7. If you should travel 9 miles an hour, how long would it take you to go 81 miles? How long to go 99 miles? How long to go 108 miles? Why?

8. A class of 9 scholars presented their teacher with a book which cost 90 cents; how many cents apiece did the book cost them? Why?

9. How many times 10 in 120? Why?

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LESSON VI.

DIVISION TABLE, — PART VI.

11 in 11, 1 time	11 in 77, 7 times
11 in 22, 2 times	11 in 88, 8 times
11 in 33, 3 times	11 in 99, 9 times
11 in 44, 4 times	11 in 110, 10 times
11 in 55, 5 times	11 in 121, 11 times
11 in 66, 6 times	11 in 132, 12 times

12 in 12, 1 time	12 in 84, 7 times
12 in 24, 2 times	12 in 96, 8 times
12 in 36, 3 times	12 in 108, 9 times
12 in 48, 4 times	12 in 120, 10 times
12 in 60, 5 times	12 in 132, 11 times
12 in 72, 6 times	12 in 144, 12 times

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MENTAL EXERCISES.

1. Here are 22 little girls in this beautiful arbor; if 11 can sit on one seat, how many seats will accommodate the whole? ANS. 2 seats.

Why 2 seats? *Because, if* 11 *girls can sit on* 1 *seat*, 22 *girls will require as many seats as* 11 *is contained times in* 22; 11 *in* 22, 2 *times, since* 2 *times* 11 *are* 22. *Therefore, the* 22 *girls will require* 2 *seats.*

2. If you divide 24 grapes equally between 12 of these girls, how many grapes will each one receive? Why? How many, if you divide 36 equally between them? Why?

3. At 11 cents a yard, how many yards of edging can you buy for 33 cents? For 55 cents? For 44 cents? Why?

4. In one year there are 12 calendar months; how many years in 48 calendar months? In 72? In 60? Why?

5. At the rate of 11 miles an hour, how long will it take a man to travel 66 miles? How long to travel 88 miles? 77 miles? Why?

6. When satin is 12 shillings a yard, how many yards can be bought for 84 shillings? For 108 shillings? For 96 shillings? Why?

7. George bought a drawing-book for 11 cents; how many could he buy for 99 cents? For 121 cents? For 110 cents? Why?

8. How many cows, at 12 dollars apiece, can be bought for 120 dollars? For 132 dollars? For 144 dollars? Why?

9. A merchant bought a piece of silk, containing 132 yards; how many dresses can be made from it, allowing 11 yards for a dress? Why?

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LESSON VII.

MISCELLANEOUS REVIEW.

1. 2 in 6, how many times?
2. 2 in 8, how many times?
3. 2 in 12, how many times?
4. 2 in 10, how many times?
5. 2 in 14, how many times?
6. 2 in 18, how many times?
7. 2 in 16, how many times?
8. 2 in 22, how many times?
9. 2 in 20, how many times?
10. 2 in 24, how many times?
11. 3 in 15, how many times?
12. 3 in 12, how many times?
13. 3 in 18, how many times?
14. 3 in 24, how many times?
15. 3 in 21, how many times?
16. 3 in 27, how many times?
17. 3 in 33, how many times?
18. 3 in 30, how many times?
19. 3 in 36, how many times?
20. 4 in 24, how many times?
21. 4 in 28, how many times?
22. 4 in 36, how many times?
23. 4 in 32, how many times?
24. 4 in 44, how many times?
25. 4 in 40, how many times?
26. 4 in 48, how many times?
27. 5 in 25, how many times?
28. 5 in 35, how many times?
29. 5 in 30, how many times?
30. 5 in 45, how many times?
31. 5 in 40, how many times?

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LESSON VIII.

MISCELLANEOUS REVIEW.

1. 5 in 55, how many times?
2. 5 in 50, how many times?
3. 5 in 60, how many times?
4. 6 in 36, how many times?
5. 6 in 48, how many times?
6. 6 in 42, how many times?
7. 6 in 54, how many times?
8. 6 in 66, how many times?
9. 6 in 60, how many times?
10. 6 in 72, how many times?
11. 7 in 49, how many times?
12. 7 in 63, how many times?
13. 7 in 56, how many times?
14. 7 in 77, how many times?
15. 7 in 70, how many times?
16. 7 in 84, how many times?
17. 8 in 64, how many times?
18. 8 in 88, how many times?
19. 8 in 72, how many times?
20. 8 in 80, how many times?
21. 8 in 96, how many times?
22. 9 in 81, how many times?
23. 9 in 99, how many times?
24. 9 in 90, how many times?
25. 9 in 108, how many times?
26. 10 in 110, how many times?
27. 10 in 100, how many times?
28. 10 in 120, how many times?
29. 11 in 132, how many times?
30. 11 in 121, how many times?
31. 12 in 144, how many times?

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LESSON IX.

MISCELLANEOUS REVIEW.

1. 5 and 3, less 2, multiplied by 4, and divided by 3, are how many? ANS. 8.

Why 8? *Because* 5 *and* 3 *more make* 8, *and* 2 *from* 8 *leaves* 6; 4 *times* 6 *are* 24, *and* 3 *in* 24, 8 *times.*

2. 6 and 4, less 2, multiplied by 3, and divided by 4, are how many? Why?

3. 7 and 2, less 3, multiplied by 5, and divided by 3, are how many? Why?

4. 6 and 5, less 4, multiplied by 2, and divided by 7, are how many? Why?

5. 8 and 6, less 9, multiplied by 4, and divided by 10, are how many? Why?

6. 9 and 7, less 8, multiplied by 3, and divided by 12, are how many? Why?

7. 7 and 6, less 3, multiplied by 6, and divided by 5, are how many? Why?

8. 8 and 7, less 6, multiplied by 4, and divided by 6, are how many? Why?

9. 10 and 9, less 8, multiplied by 3, and divided by 11, are how many? Why?

10. 11 and 9, less 10, multiplied by 4, and divided by 8, are how many? Why?

11. 12 and 5, less 9, multiplied by 9, and divided by 6, are how many? Why?

12. 12 and 9, less 11, multiplied by 12, and divided by 10, are how many? Why?

13. 11 and 8, less 7, multiplied by 6, and divided by 9, are how many? Why?

14. 11 and 10, less 12, multiplied by 4, and divided by 3, are how many? Why?

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LESSON X.

MISCELLANEOUS REVIEW.

1. Franklin bought 12 pears, at 2 cents apiece, and agreed to pay for them with walnuts, at 8 cents a quart; how many quarts will it take?

ANS. 3 quarts.

Why 3 quarts? *Because* 12 *pears, at* 2 *cents apiece, will cost* 24 *cents; and since he gets* 8 *cents a quart for his walnuts, it will take as many quarts to pay for the pears as* 8 *cents are contained times in* 24 *cents;* 8 *cents in* 24 *cents,* 3 *times, since* 3 *times* 8 *are* 24. *Therefore, it will take* 3 *quarts.*

2. Henry divided 35 peaches equally between 7 of his companions; how many did he give to each?

3. When flour is 6 dollars a barrel, how many barrels can be bought for 18 dollars? For 36 dollars?

4. In 24, how many times 3? How many times 6? How many times 2? How many times 8? Why?

5. In 8 times 5, how many times 10? How many times 4? Why?

6. How many are 9, and 6, and 4, less 11, multiplied by 6, and divided by 12? Why?

7. A farmer bought 8 yards of broadcloth, at 3 dollars a yard, and paid for it with hay, at 6 dollars a ton; how many tons did it require? Why?

8. How many pounds of butter, at 12 cents a pound, will it take to pay for 9 yards of sheeting, at 8 cents a yard? Why?

9. Caroline bought 2 arithmetics, at 12 cents apiece, 2 slates, at 10 cents apiece, 5 pencils, at 1 cent apiece, and a spelling-book for 11 cents, and paid for them in 10 cent pieces; how many ten cent pieces did it take?

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MISCELLANEOUS EXERCISES.

LESSON I.

1. A gentleman gave 6 sticks of candy to Charles, 5 to James, and 4 to Thomas; how many sticks of candy did he give to all of them? Why?

2. Ellen had 15 pinks, but she gave 6 to Mary, and 4 to Jane; how many did she keep for herself?

3. A little boy went to the orchard, and found 8 apples under one tree, 7 under another, and 6 under another; but on his way home he ate 2, and lost 9; how many apples did he carry home? Why?

4. A farmer bought a cow for 12 dollars, and a sheep for 3 dollars, and afterwards sold them both for 20 dollars; how much did he gain by his bargain?

5. William bought an arithmetic for 15 cents, and a quire of paper for 12 cents; how much did he pay for both? Why?

6. A lady, having 25 pounds of butter, sold at one time 12 pounds, and at another time 10 pounds; how many pounds has she left? Why?

7. Amasa has 30 cents in three boxes: there are 12 cents in the first box, and 8 in the second; how many are there in the third? Why?

8. Nancy paid 10 shillings for a dress, 6 shillings for a pair of shoes, and 4 shillings for a pair of gloves; what was the cost of the whole? Why?

9. Martin, having 28 marbles, gave 10 to Albert and lost 6; how many has he left? Why?

10. A drover has 10 horses in one pasture, 8 in another, and 7 in another; how many has he in all? Why?

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LESSON II.

1. Lucy bought 8 yards of ribbon, at 2 cents a yard; how many cents did she pay for it? Why?

2. Oliver paid 9 cents a quart, for 3 quarts of filberts; how much did they come to? Why?

3. What cost 4 pounds of spice, at 11 cents a pound? What cost 6 pounds? 8 pounds? Why?

4. At 12 shillings apiece, what will 3 parasols cost? What will 5 cost? What will 7 cost? Why?

5. Emily paid 10 cents for a yard of silk braid; what will 3 yards cost, at the same rate? 5 yards? 8 yards? 10 yards? Why?

6. When flour is 5 dollars a barrel, what will 5 barrels cost? 7 barrels? 8 barrels? 10 barrels? 11 barrels? 12 barrels? Why?

7. At 3 cents apiece, how many lemons can you buy for 18 cents? For 27 cents? For 24 cents? For 30 cents? For 36 cents? Why?

8. Calvin sold 6 quarts of chestnuts, at 10 cents a quart, and took his pay in spelling-books, at 12 cents apiece; how many spelling-books did he receive? Why?

9. Sarah bought a thimble for 6 cents, 3 pencils, at 2 cents apiece, and a copy-book for 11 cents; what did she pay for the whole? Why?

10. A hatter sold 5 hats, at 4 dollars apiece, and 2 caps, at 3 dollars apiece; how much did he receive for his hats and caps? Why?

11. A milliner cut and fitted four dresses for 2 dollars, and sold 6 bonnets, at 3 dollars apiece; how much did she receive for the whole? Why?

12. Which is the most, 9 times 9, or 8 times 10?

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LESSON III.

1. If 4 hats cost 12 dollars, what will 1 hat cost?

ANS. 3 dollars.

Why 3 dollars? *Because, if* 4 *hats cost* 12 *dollars,* 1 *hat will cost as many dollars as* 4 *is contained times in* 12; 4 *in* 12, 3 *times, since* 3 *times* 4 *are* 12. *Therefore,* 1 *hat will cost* 3 *dollars.*

2. Samuel gave 18 cents for 6 oranges; how much did they cost him apiece? Why?

3. A farmer paid 36 dollars for 12 sheep; what was the cost of 1 sheep? Of 2 sheep? Of 7 sheep? Of 5 sheep? Of 9 sheep? Why?

4. When 8 yards of cloth can be bought for 24 dollars, what will 1 yard cost? 2 yards? 4 yards? 10 yards? 12 yards? Why?

5. In 60, how many times 12? How many times 10? How many times 5? How many times 6?

6. Charles sold 6 quarts of beechnuts, at 4 cents a quart, and took his pay in pears, at 2 cents apiece; how many pears did he receive? Why?

7. A gentleman divided 48 apples equally between 5 girls and 3 boys; how many did he give to each?

8. In 19, how many times 4, and how many over?

ANS. 4 *in* 19, 4 *times and* 3 *over.*

9. In 26, how many times 5, and how many over? How many times 8, and how many over? Why?

10. In 40, how many times 6, and how many over? How many times 9, and how many over? Why?

11. How many barrels of flour, at 6 dollars a barrel, will pay for 3 barrels of pork, at 10 dollars a barrel?

12. How many pounds of nails, at 8 cents a pound, can I buy with 10 pounds of iron, at 5 cents a pound?

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LESSON IV.

1. If 4 men can do a piece of work in 3 days, how long will it take 1 man to do the same work?

ANS. 12 days.

Why 12 days? *Because it will take* 1 *man* 4 *times as long as it will* 4 *men;* 4 *times* 3 *days are* 12 *days. Therefore, it will take* 1 *man* 12 *days.*

2. If 8 men can build a shed in 10 days, how many men must be employed to build it in 1 day? Why?

3. When 5 men can hoe a field of corn in 6 days, how long will it take one man? Why?

4. A lady bought 2 yards of cambric, at 10 cents a yard, 4 spools of cotton thread, at 3 cents apiece, and a book for 8 cents; what was the cost of the whole?

5. Elisha bought 3 sheets of gingerbread, at 8 cents a sheet, and 2 watermelons, at 10 cents apiece, and then sold the whole for 50 cents; how much did he gain by his bargain? Why?

6. A cabinet-maker received 24 dollars for chairs, at 3 dollars apiece; how many chairs did he sell?

7. A grocer sold 9 pounds of sugar, at 8 cents a pound, and took his pay in lard, at 6 cents a pound; how many pounds of lard did he receive? Why?

8. When shoes are 2 dollars a pair, how many pairs can be bought for 10 dollars? For 16 dollars? For 20 dollars? For 24 dollars? Why?

9. If 3 vests cost 15 dollars, what will 1 vest cost? 4 vests? 8 vests? 10 vests? 12 vests? Why?

10. How many times 6 in 38, and how many over? How many times 9 in 57, and how many over? Why?

11. How many times 8 in 7 times 12, and how many over? How many times 9? Why?

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LESSON V.

1. What cost 3 pounds of raisins, at 12 cents a pound? Why?

2. What is the value of 9 boxes of oranges, at 4 dollars a box? Why?

3. At 6 shillings apiece, what will 4 cravats cost? 6 cravats? 9 cravats? Why?

4. How many are 7, and 4, and 5, and 8, less 12, multiplied by 6, and divided by 9? Why?

5. What is the difference between 5 times 6, and 3 times 11? 6 times 9, and 7 times 8? Why?

6. What is the difference between 4 times 12, less 8, and 4 times 9, and 3? Why?

7. Which is the most, 9 times 8, less 12, or 6 times 8, and 10? Why?

8. What cost 2 pounds of coffee, at 9 cents a pound? What cost 4 pounds? 7 pounds? 8 pounds? 9 pounds? 10 pounds? Why?

9. At 4 dollars a yard, how many yards of cloth can you buy for 20 dollars? For 28 dollars? For 36 dollars? For 48 dollars? Why?

10. How many cords of wood, at 6 dollars a cord, will pay for 9 barrels of flour, at 4 dollars a barrel?

11. If 5 yards of ribbon cost 15 cents, what will 1 yard cost? 6 yards? 4 yards? 8 yards? 10 yards? 11 yards? 12 yards? Why?

12. Emily paid 20 cents for 2 papers of pins; what cost 1 paper? What will 4 papers cost, at the same rate? 7 papers? 9 papers? 11 papers? Why?

13. If 4 pairs of skates cost 24 shillings, what cost 1 pair? What will 3 pairs cost? 5 pairs? 7 pairs? 6 pairs? 10 pairs? Why?

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LESSON VI.

1. Erastus bought a sled for 50 cents; at one time he paid 15 cents, at another time 12 cents, at another time 10 cents, and at another time 8 cents; how much does he still owe? Why?

2. A farmer sold a horse for 60 dollars, and received in payment 2 cows, at 12 dollars apiece, 4 yards of cloth, at 5 dollars a yard, a watch worth 10 dollars, and the balance in money; how much money did he receive? Why?

3. If two men start from the same place, and travel in opposite directions, one at the rate of 4 miles an hour, and the other at the rate of 6 miles an hour, how far apart will they be at the end of 1 hour? At the end of 2 hours? 4 hours? 10 hours? Why?

4. If two men start from the same place, and travel the same way, one at the rate of 3 miles an hour, and the other at the rate of 5 miles an hour, how far apart will they be at the end of 1 hour? At the end of 3 hours? 5 hours? 7 hours? 9 hours? 12 hours?

5. A family of 5 persons has provision sufficient to last 6 weeks; how long will it last 1 person? Why?

6. A grocer sold 8 ounces of nutmegs for 48 cents; what was the price of 1 ounce? 3 ounces? 4 ounces? 7 ounces? Why?

7. In 9 times 4, how many times 3? How many times 6? How many times 12? Why?

8. At the rate of 5 miles an hour, how long will it take a man to travel 30 miles? 40 miles? 50 miles?

9. If you should read 12 pages each day, how long would it take you to read a book through containing 72 pages? 96 pages? 120 pages? 144 pages? Why?

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FRACTIONS.

LESSON I.

When any number or thing is divided into *parts*, each one of the parts is called a FRACTION of the number or thing divided; thus,

A.— 1. If any number or thing, as an (*apple*,) is divided into (*two*) equal parts, each of the parts is called *one half* of the apple, and is expressed by figures thus, $\frac{1}{2}$ (*one half.*)

2. If any number or thing, as an (*apple*,) is divided into (*three*) equal parts, each of the parts is called $\frac{1}{3}$ (*one third*) of the apple, and *two* of the parts $\frac{2}{3}$ (*two thirds.*)

3. If any number or thing, as an (*apple*,) is divided into (*four*) equal parts, each of the parts is called $\frac{1}{4}$ (*one fourth or one quarter*,) of the apple; and *three* of the parts $\frac{3}{4}$ (*three fourths.*)

4. If any number or thing is divided into *five* equal parts, each of the parts is called $\frac{1}{5}$ (*one fifth*,) *two* of the parts $\frac{2}{5}$ (*two fifths*,) *three* of the parts $\frac{3}{5}$ (*three fifths*,) and *four* parts $\frac{4}{5}$ (*four fifths.*)

5. If any number or thing is divided into *six* equal parts, each of the parts is called $\frac{1}{6}$ (*one sixth.*) What are 2 of the parts called? 3 parts? 4 parts? 5 parts?

6. If any number or thing is divided into *seven* equal parts, each of the parts is called $\frac{1}{7}$ (*one seventh.*) What are 2 parts called? 3 parts? 4 parts? 5 parts?

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7. If any number or thing is divided into *eight* equal parts, each of the parts is called $\frac{1}{8}$ (*one eighth.*) What are 2 parts called? 3 parts? 4 parts? 5 parts? 6 parts? 7 parts?

8. If any number or thing is divided into *nine* equal parts, each of the parts is called $\frac{1}{9}$ (*one ninth.*) What are 2 parts called? 3 parts? 4 parts? 5 parts? 6 parts? 7 parts? 8 parts?

9. If any number or thing is divided into *ten* equal parts, each of the parts is called $\frac{1}{10}$ (*one tenth.*) What are 2 parts called? 3 parts? 4 parts? 5 parts? 6 parts? 7 parts? 8 parts? 9 parts?

10. If any number or thing is divided into *eleven* equal parts, each of the parts is called $\frac{1}{11}$ (*one eleventh.*) What are 2 parts called? 3 parts? 4 parts? 5 parts? 6 parts? 7 parts? 8 parts? 9 parts? 10 parts?

11. If any number or thing is divided into *twelve* equal parts, each of the parts is called $\frac{1}{12}$ (*one twelfth.*) What are 2 parts called? 3 parts? 4 parts? 5 parts? 6 parts? 7 parts? 8 parts? 9 parts? 10 parts? 11 parts?

12. If any number or thing is divided into *twenty* equal parts, each of the parts is called $\frac{1}{20}$ (*one twentieth.*) What are 2 parts called? 3 parts? 4 parts? 6 parts? 9 parts? 12 parts? 13 parts? 15 parts? 18 parts? 19 parts?

REMARK. In any fraction, as $\frac{3}{4}$, (*three fourths,*) the number *below* the line is called the DENOMINATOR, because it shows into how many equal parts the whole number or thing is divided, and therefore determines the *size* of the parts, and the *name* of the fraction. The number *above* the line is called the NUMERATOR, because it shows the *number* of parts that are used, or that are expressed by the fraction.

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LESSON II.

B. — 1. What now do you understand by $\frac{1}{2}$ of any number or thing?

ANS. *ONE *of the* TWO *equal parts into which the number or thing has been divided.*

2. What do you understand by $\frac{1}{3}$, by $\frac{2}{3}$, and by $\frac{3}{3}$ (*three thirds*,) of any number or thing?

ANS. *By* $\frac{1}{3}$, *I understand* ONE *of the* THREE *equal parts into which the number or thing has been divided; by* $\frac{2}{3}$, TWO *of the* THREE *equal parts; and by* $\frac{3}{3}$, *the* THREE *equal parts, or the whole number or thing.*

3. What do you understand by $\frac{1}{4}$ of any number or thing? What by $\frac{3}{4}$? By $\frac{1}{5}$? By $\frac{2}{5}$? By $\frac{1}{6}$? By $\frac{5}{6}$? By $\frac{1}{7}$? By $\frac{4}{7}$? By $\frac{1}{8}$? By $\frac{3}{8}$? By $\frac{1}{9}$? By $\frac{7}{9}$? By $\frac{1}{10}$? By $\frac{9}{10}$? By $\frac{1}{11}$? By $\frac{5}{11}$? By $\frac{1}{12}$? By $\frac{11}{12}$? By $\frac{1}{20}$? By $\frac{7}{20}$? By $\frac{1}{30}$? By $\frac{9}{30}$?

C. — 4. How can you find $\frac{1}{2}$ of any number?

ANS. *Divide the given number by* 2.

5. How can you find $\frac{1}{3}$ of any number?

ANS. *Divide the given number by* 3.

6. How then will you find $\frac{1}{4}$ of any number? How $\frac{1}{5}$? How $\frac{1}{6}$? How $\frac{1}{7}$? How $\frac{1}{8}$? How $\frac{1}{9}$? How $\frac{1}{10}$? How $\frac{1}{11}$? How $\frac{1}{12}$? How $\frac{1}{20}$? How $\frac{1}{30}$?

7. What is $\frac{1}{2}$ of 4? Of 8? Of 12? Of 16?

8. What is $\frac{1}{3}$ of 3? Of 9? Of 15? Of 18? Of 21?

9. What is $\frac{1}{4}$ of 8? Of 12? Of 4? Of 20? Of 24?

10. What is $\frac{1}{5}$ of 10? Of 5? Of 20? Of 25?

11. What is $\frac{1}{6}$ of 12? $\frac{1}{7}$ of 21? $\frac{1}{8}$ of 32? $\frac{1}{9}$ of 36? $\frac{1}{10}$ of 40? $\frac{1}{11}$ of 44? $\frac{1}{12}$ of 48?

12. When flour is worth 6 dollars a barrel, what is $\frac{1}{3}$ of a barrel worth? Why?

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LESSON III.

D.—1. When hay is worth 9 dollars a ton, what is $\frac{2}{3}$ of a ton worth? ANS. 6 dollars.

Why 6 dollars? *Because, if a ton is worth* 9 *dollars,* $\frac{1}{3}$ *of a ton is worth* $\frac{1}{3}$ *of* 9 *dollars;* $\frac{1}{3}$ *of* 9 *dollars is* 3 *dollars. Now, if* $\frac{1}{3}$ *of a ton is worth* 3 *dollars,* $\frac{2}{3}$ *of a ton will be worth* 2 *times* 3 *dollars;* 2 *times* 3 *dollars are* 6 *dollars. Therefore,* $\frac{2}{3}$ *of a ton is worth* 6 *dollars.*

2. There are 40 rods in a furlong; how many rods are there in $\frac{1}{4}$ of a furlong? Why? In $\frac{3}{4}$ of a furlong? Why? In $\frac{4}{5}$ of a furlong? Why?

3. In New England there are 6 shillings in a dollar; how many shillings in $\frac{1}{6}$ of a dollar? In $\frac{5}{6}$ of a dollar? Why?

4. A boy, having 24 pears, gave $\frac{1}{8}$ of them to John, $\frac{3}{8}$ to Charles, and $\frac{4}{8}$ to Samuel; how many pears did each boy receive? Why?

E.—5. How many parts of any number or thing make a whole one?

ANS. *The same number of parts into which the whole one has been divided.*

6. How many *halves*, then, make a whole one?

ANS. $\frac{2}{2}$ (*two halves.*)

Why $\frac{2}{2}$? *Because the whole number or thing has been divided into* TWO *equal parts.*

7. How many *thirds* make a whole one? How many *fourths?* How many *fifths?* How many *sixths?* How many *sevenths?* Why?

8. How many *eighths* make a whole one? How many *ninths?* How many *tenths?* How many *elevenths?* How many *twelfths?* How many *eighteenths?*

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LESSON IV.

F.—1. 4 is $\frac{1}{2}$ of what number? ANS. 8.

Why 8? *Because, if* 4 *is* $\frac{1}{2}$ *of some number,* $\frac{2}{2}$, *or the whole number, will be* 2 *times* 4; 2 *times* 4 *are* 8. *Therefore,* 4 *is* $\frac{1}{2}$ *of* 8.

2. 3 is $\frac{1}{3}$ of what number? Why?
3. 5 is $\frac{1}{4}$ of what number? Why?
4. 7 is $\frac{1}{8}$ of what number? Why?
5. 6 is $\frac{1}{5}$ of what number? Why?
6. 4 is $\frac{1}{6}$ of what number? Why?
7. 6 is $\frac{1}{8}$ of what number? Why?
8. 8 is $\frac{1}{10}$ of what number? Why?
9. 2 is $\frac{1}{12}$ of what number? Why?
10. 9 is $\frac{1}{11}$ of what number? Why?

11. A man bought $\frac{1}{3}$ of a cord of wood for 2 dollars; how much will a cord cost, at the same rate? Why?

12. If $\frac{1}{5}$ of a pound of chocolate cost 4 cents, what will a pound cost? Why?

13. A lady paid 12 cents for $\frac{1}{8}$ of a yard of silk; how much must she pay for a yard? Why?

14. A boy gave away 6 walnuts, which was $\frac{1}{10}$ of all he had; how many had he at first? Why?

15. If $\frac{1}{7}$ of a ton of potash is worth 11 dollars, what is a ton worth? Why?

16. A man bought a horse, and paid 9 dollars down, which was $\frac{1}{12}$ of the whole price; what was the price of the horse? Why?

17. James bought a kite, and sold it to John for 5 cents more than he gave for it, which was just $\frac{1}{4}$ of the price he paid for it; how much did he pay for it? Why?

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LESSON V.

C. — 1. Levi bought $\frac{1}{4}$ of a pound of raisins for 4 cents; what would $\frac{3}{4}$ of a pound cost, at the same rate? ANS. 12 cents.

Why 12 cents? *Because, if $\frac{1}{4}$ of a pound cost* 4 *cents, $\frac{3}{4}$ of a pound will cost* 3 *times* 4 *cents;* 3 *times* 4 *cents are* 12 *cents. Therefore, $\frac{3}{4}$ of a pound will cost* 12 *cents.*

2. If $\frac{1}{5}$ of an acre of land cost 6 dollars, what will $\frac{3}{5}$ of an acre cost? What will $\frac{1}{5}$ cost? Why?

3. There are 5 yards in $\frac{1}{8}$ of a piece of cloth; how many yards are there in $\frac{3}{8}$ of the piece? In $\frac{5}{8}$ of the piece? In the whole piece? Why?

4. In $\frac{1}{10}$ of a dollar there are 10 cents; how many cents in $\frac{4}{10}$ of a dollar? In $\frac{7}{10}$ of a dollar? In $\frac{9}{10}$ of a dollar? In a whole dollar? Why?

H. — 5. How many *halves* are there in 3 whole numbers or things? ANS. $\frac{6}{2}$ (*six halves*).

Why $\frac{6}{2}$? *Because, if there are $\frac{2}{2}$ in* 1 *whole one, in* 3 *whole ones there are* 3 *times $\frac{2}{2}$;* 3 *times $\frac{2}{2}$ are $\frac{6}{2}$. Therefore, in* 3 *whole ones, there are $\frac{6}{2}$.**

6. How many thirds are there in 4? In 6? In 8?
7. How many fifths are there in 2? In 7? In 5?
8. How many fourths are there in 3? In 6? In 9?
9. How many sevenths are there in 4? In 6? In 7?
10. How many sixths are there in 6? In 8? In 5?
11. How many ninths are there in 2? In 5? In 4?
12. How many elevenths are there in 3? In 7?
13. How many eighths are there in 7? In 10?

* When the numerator is equal to, or greater than, the denominator, as in $\frac{2}{2}$, $\frac{5}{5}$, the fraction is called an *improper* fraction, because it is equal to one or more whole ones.

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14. How many tenths are there in 5? In 8? In 3?

15. At $\frac{1}{4}$ of a cent apiece, how many slate pencils can be bought for 7 cents? Why?

16. John bought a penknife for $\frac{1}{8}$ of a dollar; how many penknives could he buy for 3 dollars, at the same rate? Why?

LESSON VI.

I. — 1. In $\frac{2}{3}$, how many whole ones? Ans. 2.

Why 2? *Because, if in* 1 *whole one there are* $\frac{3}{3}$, *in* $\frac{2}{3}$ *there are as many whole ones as* $\frac{3}{3}$ *are contained times in* $\frac{2}{3}$; $\frac{3}{3}$ *in* $\frac{6}{3}$, 2 *times. Therefore, in* $\frac{6}{3}$ *there are* 2 *whole ones.*

2. How many whole ones in $\frac{4}{2}$? In $\frac{8}{3}$? In $\frac{12}{4}$? In $\frac{20}{5}$? In $\frac{18}{6}$? In $\frac{21}{7}$? In $\frac{48}{8}$? In $\frac{36}{9}$? Why?

3. How many whole ones in $\frac{16}{8}$? In $\frac{27}{9}$? In $\frac{40}{10}$? In $\frac{66}{11}$? In $\frac{96}{12}$? In $\frac{42}{7}$? In $\frac{12}{6}$? In $\frac{108}{9}$? Why?

4. A boy sold 16 melons for $\frac{1}{8}$ of a dollar apiece; how many dollars did he receive? Why?

5. If a scholar should be idle $\frac{1}{7}$ of each day, how much time will he lose in 28 days? Why?

6. If a family consume $\frac{1}{3}$ of a barrel of flour in a week, how many barrels will they consume in 18 weeks? Why?

J. — 7. In $\frac{7}{5}$, how many whole ones?

Ans. $1\frac{2}{5}$ * (*one and two-fifths*).

Why $1\frac{2}{5}$? *Because, if in* 1 *whole one there are* $\frac{5}{5}$, *in* $\frac{7}{5}$ *there are as many whole ones as* $\frac{5}{5}$ *are contained times in* $\frac{7}{5}$; $\frac{5}{5}$ *in* $\frac{7}{5}$, 1 *time and* $\frac{2}{5}$ *over. Therefore, in* $\frac{7}{5}$ *there is* 1 *whole one and* $\frac{2}{5}$.

* Any expression like this, $1\frac{2}{5}$, is called a mixed number, because it consists of a whole number and a fraction. This expression is read, *one and two-fifths.*

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8. How many whole ones in $\frac{3}{2}$? In $\frac{8}{3}$? In $\frac{11}{4}$? In $\frac{16}{5}$? In $\frac{23}{6}$? In $\frac{11}{3}$? In $\frac{21}{4}$? Why?

9. How many whole ones in $\frac{25}{7}$? In $\frac{35}{8}$? In $\frac{38}{9}$? In $\frac{41}{11}$? In $\frac{47}{12}$? In $\frac{32}{6}$? In $\frac{75}{8}$? In $\frac{104}{11}$? Why?

10. If Annette writes $\frac{1}{8}$ of a page at each exercise, how many pages will she write in 13 exercises? Why?

11. A grocer sold 23 pounds of sugar, at $\frac{1}{10}$ of a dollar a pound; how many dollars did it amount to?

12. If Thomas can pick $\frac{1}{7}$ of a bushel of cranberries in an hour, how many bushels can he pick in 17 hours? Why?

LESSON VII.

K. — 1. A lady gave $\frac{1}{7}$ of an orange to Mary, $\frac{5}{7}$ to Sarah, and $\frac{6}{7}$ to Susan; how many oranges did she give away? ANS. $2\frac{4}{7}$ oranges.

Why $2\frac{4}{7}$? *Because* $\frac{1}{7}$ *and* $\frac{5}{7}$ *are* $\frac{6}{7}$, *and* $\frac{6}{7}$ *more make* $\frac{12}{7}$, *which are equal to* $2\frac{4}{7}$. *Therefore, the lady gave away* 2 *oranges and* $\frac{4}{7}$.

2. What is the sum of $\frac{1}{5}$ and $\frac{2}{5}$? Why?

3. What is the sum of $\frac{1}{8}$, and $\frac{2}{8}$, and $\frac{3}{8}$? Why?

4. What is the sum of $\frac{2}{11}$, and $\frac{3}{11}$, and $\frac{5}{11}$? Why?

5. In the sum of $\frac{1}{3}$ and $\frac{2}{3}$, how many whole ones?

6. In the sum of $\frac{1}{4}$, and $\frac{2}{4}$, and $\frac{3}{4}$, how many whole ones? Why?

7. In the sum of $\frac{1}{6}$, and $\frac{2}{6}$, and $\frac{3}{6}$, and $\frac{4}{6}$, how many whole ones? Why?

8. In the sum of $\frac{3}{8}$, and $\frac{4}{8}$, and $\frac{1}{8}$, and $\frac{7}{8}$, how many whole ones? Why?

9. In the sum of $\frac{3}{12}$, and $\frac{8}{12}$, and $\frac{5}{12}$, and $\frac{11}{12}$, how many whole ones? Why?

10. John bought $\frac{1}{4}$ of a pound of raisins, and James

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bought $\frac{3}{4}$ of a pound; how many pounds did they both buy? Why?

11. George had $\frac{2}{8}$ of a dollar, and his father gave him $\frac{3}{8}$ of a dollar more; what part of a dollar had he then? Why?

12. A blacksmith bought at one time $\frac{2}{5}$ of a ton of coal, at another time $\frac{3}{5}$ of a ton, at another time $\frac{4}{5}$ of a ton, and at another time $\frac{1}{5}$ of a ton; how many tons did he buy in all? Why?

13. Samuel gave $\frac{1}{10}$ of a dollar for a slate, $\frac{3}{10}$ of a dollar for an arithmetic, $\frac{7}{10}$ for a reader, and $\frac{9}{10}$ for a geography and atlas; how many dollars did he pay for the whole? Why?

LESSON VIII.

L. — 1. A gentleman, having $\frac{7}{8}$ of an acre of land, sold $\frac{5}{8}$ of an acre; what part of an acre had he left?

ANS. $\frac{2}{8}$ of an acre.

Why $\frac{2}{8}$? *Because* $\frac{5}{8}$ *and* $\frac{2}{8}$ *more make* $\frac{7}{8}$; *therefore, if we take the* $\frac{5}{8}$ *from* $\frac{7}{8}$, $\frac{2}{8}$ *will remain.*

2. $\frac{3}{4}$ less $\frac{1}{4}$ are how many fourths? Why?

3. $\frac{4}{5}$ less $\frac{2}{5}$ are how many fifths? Why?

4. $\frac{6}{7}$ less $\frac{3}{7}$ are how many sevenths? Why?

5. $\frac{7}{9}$ less $\frac{4}{9}$ are how many ninths? Why?

6. $\frac{3}{10}$ and $\frac{9}{10}$, less $\frac{7}{10}$, are how many tenths? Why?

7. $\frac{5}{11}$, and $\frac{4}{11}$, and $\frac{1}{11}$, less $\frac{2}{11}$, are how many elevenths? Why?

8. $\frac{1}{12}$ and $\frac{5}{12}$, less $\frac{4}{12}$, are how many? Why?

9. Luther owns $\frac{4}{8}$ of a kite, and Mark the remainder; what part of the kite does Mark own? Why?

10. Maria, having a quire of paper, gave $\frac{1}{8}$ of it to Eveline, and $\frac{4}{8}$ to Eliza; what part did she keep for herself? Why?

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11. On training-day, James spent $\frac{3}{8}$ of his money, and lost $\frac{2}{8}$ of it on his way home; what part of his money had he left? Why?

12. A gentleman distributed a cord of wood among three poor families; to the first he gave $\frac{5}{11}$ of a cord, to the second $\frac{4}{11}$, and the remainder to the third; what part of a cord did the third family receive? Why?

LESSON IX.

M. — 1. When corn is $\frac{3}{4}$ of a dollar a bushel, what will 4 bushels cost? ANS. 3 dollars.

Why 3 dollars? *Because, if* 1 *bushel cost* $\frac{3}{4}$ *of a dollar*, 4 *bushels will cost* 4 *times* $\frac{3}{4}$; 4 *times* $\frac{3}{4}$ *are* $\frac{12}{4}$, *equal to* 3 *dollars. Therefore,* 4 *bushels will cost* 3 *dollars.*

2. How many are 3 times $\frac{2}{3}$? Why?
3. How many are 5 times $\frac{2}{5}$? Why?
4. How many are 6 times $\frac{1}{7}$? Why?
5. How many are 7 times $\frac{5}{6}$? Why?
6. How many are 10 times $\frac{1}{10}$? Why?
7. How many are 9 times $\frac{5}{8}$? Why?
8. How many are 11 times $\frac{4}{11}$? Why?
9. How many are 8 times $\frac{6}{10}$? Why?
10. How many are 12 times $\frac{7}{8}$? Why?
11. If a man earn $\frac{1}{2}$ of a dollar in a day, how many dollars will he earn in 8 days? Why?
12. How many cents will 7 skeins of thread come to, at $\frac{3}{4}$ of a cent apiece? Why?
13. If it take $\frac{7}{8}$ of a yard of silk to line a coat, how many yards will it take to line 9 coats? Why?
14. A boy worked 11 days for $\frac{2}{3}$ of a dollar a day; how many dollars did he receive? Why?

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15. Melvin gave $\frac{3}{10}$ of a dollar for a pair of gloves, and 7 times as much for a hat; what was the price of his hat? Why?

LESSON X.

N. — 1. What will 8 yards of tape cost, at $2\frac{1}{4}$ cents a yard? ANS. 18 cents.

Why 18 cents? *Because, if* 1 *yard cost* $2\frac{1}{4}$ *cents*, 8 *yards will cost* 8 *times* $2\frac{1}{4}$ *cents;* 8 *times* $2\frac{1}{4}$ *cents are equal to* 8 *times* 2, *and* 8 *times* $\frac{1}{4}$; 8 *times* 2 *are* 16, *and* 8 *times* $\frac{1}{4}$ *are* $\frac{8}{4}$, *equal to* 2 *whole ones, which, added to* 16, *make* 18. *Therefore, the* 8 *yards will cost* 18 *cents.*

2. How many are 3 times $6\frac{2}{3}$? Why?
3. How many are 7 times $5\frac{1}{2}$? Why?
4. How many are 5 times $7\frac{3}{5}$? Why?
5. How many are 8 times $6\frac{7}{12}$? Why?
6. How many are 4 times $9\frac{3}{8}$? Why?
7. How many are 6 times $3\frac{9}{11}$? Why?
8. If it take $3\frac{1}{2}$ yards of ribbon to trim a bonnet, how many yards will it take to trim 6 bonnets?
9. At $4\frac{3}{8}$ cents a pound, what will 8 pounds of iron come to? Why?
10. A boy sold 7 dozen of eggs, at $6\frac{1}{4}$ cents a dozen; how many cents did he receive for them? Why?
11. A drover bought 11 sheep, at $3\frac{1}{10}$ dollars apiece; what did they cost him? Why?
12. How many yards of broadcloth will it take to make 3 pairs of pantaloons, if it take $2\frac{5}{8}$ yards for 1 pair? Why?
13. Austin paid $4\frac{1}{5}$ dollars for a pair of boots; what will 10 pairs cost, at the same rate? Why?

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LESSON XI.

O.—1. When sugar is sold at 8 cents a pound, what will be the cost of $4\frac{3}{4}$ pounds? ANS. 38 cents.

Why 38 cents? *Because, if* 1 *pound cost* 8 *cents*, $4\frac{3}{4}$ *pounds will cost* $4\frac{3}{4}$ *times* 8 *cents*; $4\frac{3}{4}$ *times* 8 *cents are equal to* 4 *times* 8, *and* $\frac{3}{4}$ *of* 8; 4 *times* 8 *are* 32, *and* $\frac{3}{4}$ *of* 8 *are* 6, *which added to* 32, *make* 38. *Therefore*, $4\frac{3}{4}$ *pounds will cost* 38 *cents*.

2. How many are $2\frac{1}{2}$ times 4? Why?
3. How many are $3\frac{2}{3}$ times 6? Why?
4. How many are $4\frac{1}{4}$ times 12? Why?
5. How many are $5\frac{2}{5}$ times 10? Why?
6. How many are $6\frac{5}{6}$ times 6? Why?
7. How many are $7\frac{1}{7}$ times 7? Why?
8. How many are $4\frac{3}{8}$ times 8? Why?
9. How many are $8\frac{5}{9}$ times 9? Why?

10. If a pound of rice cost 6 cents, what will $4\frac{1}{2}$ pounds cost? Why?

11. At 9 cents a pound, what will be the cost of $5\frac{2}{3}$ pounds of lard? Why?

12. A boy sold $2\frac{3}{4}$ quarts of chestnuts, at 8 cents a quart; how many cents did he receive for them? Why?

13. A painter bought $6\frac{3}{5}$ pounds of white lead, at 10 cents a pound; how many cents did it come to? Why?

14. When wheat is 7 shillings a bushel, how many shillings must be paid for $3\frac{4}{7}$ bushels? Why?

15. Sarah bought $5\frac{2}{3}$ yards of calico, at 9 cents a yard; how many cents did it cost her? Why?

16. There are 4 quarts in one gallon; how many quarts are there in $11\frac{1}{4}$ gallons? Why?

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LESSON XII.

P.—1. A man paid 9 cents for $\frac{3}{4}$ of a pound of coffee; how much would a pound cost, at the same rate. ANS. 12 cents.

Why 12 cents? *Because, if* $\frac{3}{4}$ *of a pound cost* 9 *cents,* $\frac{1}{4}$ *of a pound will cost* $\frac{1}{3}$ *of* 9 *cents;* $\frac{1}{3}$ *of* 9 *cents is* 3 *cents, and* $\frac{4}{4}$, *or a pound, will cost* 4 *times* 3 *cents;* 4 *times* 3 *cents are* 12 *cents. Therefore, a pound will cost* 12 *cents.*

2. 6 is $\frac{3}{5}$ of what number? Why?
3. 10 is $\frac{5}{7}$ of what number? Why?
4. 8 is $\frac{4}{6}$ of what number? Why?
5. 14 is $\frac{7}{8}$ of what number? Why?
6. 12 is $\frac{3}{8}$ of what number? Why?
7. 15 is $\frac{5}{11}$ of what number? Why?
8. 16 is $\frac{4}{10}$ of what number? Why?
9. 18 is $\frac{3}{4}$ of what number? Why?
10. 21 is $\frac{7}{12}$ of what number? Why?
11. 24 is $\frac{4}{5}$ of what number? Why?

12. Ann paid 12 cents for a copy-book, which was $\frac{3}{4}$ of all the money she had; how many cents had she at first? Why?

13. George is 8 years old, and his age is just $\frac{2}{3}$ of his brother's age; what is the age of his brother? Why?

14. A man paid 10 cents for $\frac{5}{6}$ of a pound of cloves; what would a pound cost, at the same rate? Why?

15. A farmer sold a cow, and received 9 dollars down, which was $\frac{3}{8}$ of the whole price; what was the price of the cow? Why?

16. If $\frac{3}{11}$ of the distance from Portland to Boston is 30 miles, what is the whole distance? Why?

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LESSON XIII.

Q.—1. Hiram paid 1 cent for 3 apples; how much did he pay apiece for them? ANS. $\frac{1}{3}$ of a cent.

Why $\frac{1}{3}$ of a cent? *Because, if he paid* 1 *cent for* 3 *apples, for* 1 *apple he would pay* $\frac{1}{3}$ *of* 1 *cent;* $\frac{1}{3}$ *of* 1 *cent is* $\frac{1}{3}$, *since* $\frac{1}{3}$ *is one of the three equal parts into which* 1 *may be divided. Therefore, he paid* $\frac{1}{3}$ *of a cent apiece.*

2. Peter paid 2 cents for 3 sticks of candy; how much did he pay for each stick? ANS. $\frac{2}{3}$ of a cent.

Why $\frac{2}{3}$ of a cent? *Because, if he paid* 2 *cents for* 3 *sticks, for* 1 *stick he would pay* $\frac{1}{3}$ *of* 2 *cents; and since* $\frac{1}{3}$ *of* 1 *cent is* $\frac{1}{3}$, $\frac{1}{3}$ *of* 2 *cents will be* 2 *times* $\frac{1}{3}$; 2 *times* $\frac{1}{3}$ *are* $\frac{2}{3}$. *Hence,* $\frac{1}{3}$ *of* 2 *cents is the same as* $\frac{2}{3}$ *of* 1 *cent. Therefore, he paid* $\frac{2}{3}$ *of a cent for each stick.*

3. What is $\frac{1}{4}$ of 1? Of 2? Of 3?

4. What is $\frac{1}{5}$ of 2? Of 3? Of 4? Of 1?

5. What is $\frac{1}{6}$ of 1? Of 2? Of 5? Of 3?

6. What is $\frac{1}{7}$ of 3? Of 5? Of 6? Of 4? Of 2?

7. What is $\frac{1}{8}$ of 1? Of 3? Of 5? Of 7? Of 4?

8. What is $\frac{1}{9}$ of 4? $\frac{1}{10}$ of 7? $\frac{1}{11}$ of 9? $\frac{1}{12}$ of 5?

9. A boy gave $\frac{1}{8}$ of 5 pears to each of his classmates; what part of a pear did he give to each? Why?

10. If a dozen slate pencils cost 7 cents, what will $\frac{1}{8}$ of a dozen cost? Why?

11. What will $\frac{1}{4}$ of a yard of cloth cost, at 3 dollars a yard? At 2 dollars a yard? Why?

12. When a horse travels at the rate of 7 miles an hour, how far does he travel in $\frac{1}{8}$ of an hour? In $\frac{1}{9}$ of an hour? In $\frac{1}{10}$ of an hour? Why?

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LESSON XIV.

R.—1. What will $\frac{1}{8}$ of a yard of gingham cost, at 19 cents a yard? Ans. $2\frac{3}{8}$ cents.

Why $2\frac{3}{8}$ cents? *Because, if a yard cost* 19 *cents,* $\frac{1}{8}$ *of a yard will cost* $\frac{1}{8}$ *as much, or as many cents as* 8 *is contained times in* 19; 8 *in* 19, 2 *times and* 3 *over; now,* $\frac{1}{8}$ *of this* 3 *is the same as* $\frac{3}{8}$ *of* 1, *which fraction taken with the* 2 *makes* $2\frac{3}{8}$. *Therefore,* $\frac{1}{8}$ *of a yard will cost* $2\frac{3}{8}$ *cents.*

2. What is $\frac{1}{2}$ of 5? Of 11? Of 13? Of 17?

3. What is $\frac{1}{3}$ of 7? Of 8? $\frac{2}{3}$ of 10? Of 14?

4. What is $\frac{1}{4}$ of 5? Of 7? $\frac{3}{4}$ of 10? Of 15?

5. What is $\frac{1}{5}$ of 7? Of 11? $\frac{4}{5}$ of 21? Of 27?

6. What is $\frac{1}{6}$ of 8? $\frac{5}{6}$ of 14? $\frac{4}{7}$ of 23? $\frac{4}{7}$ of 17?

7. What is $\frac{1}{8}$ of 19? $\frac{5}{8}$ of 26? $\frac{1}{8}$ of 20? $\frac{5}{8}$ of 28?

8. What is $\frac{1}{10}$ of 13? $\frac{7}{10}$ of 25? $\frac{1}{11}$ of 36?

9. There are 24 hours in a day; how many hours are there in $\frac{1}{4}$ of a day? Why?

10. There are 7 days in a week; how many days are there in $\frac{3}{7}$ of a week? Why?

11. A man bought a sleigh for 22 dollars, and paid $\frac{3}{5}$ of the price in money, and gave his note for the remainder; how much did he pay in money? Why?

12. A gentleman spent 10 years in traveling; $\frac{3}{4}$ of the time he spent in France, and the remainder in England; how many years did he travel in France?

13. Horace is 35 years old, and $\frac{4}{5}$ of his age is just the age of his younger brother; what is the age of his brother? Why?

14. Luke paid 5 dollars for his hat, which was $\frac{2}{5}$ of what he paid for his coat; how much did he pay for his coat? Why?

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LESSON XV.

S. — 1. $2\frac{1}{2}$ is $\frac{1}{2}$ of what number? ANS. 5.

Why 5? *Because, if* $2\frac{1}{2}$ *is* $\frac{1}{2}$ *of some number,* $\frac{2}{2}$, *or the whole number, will be* 2 *times* $2\frac{1}{2}$; 2 *times* $2\frac{1}{2}$ *are* 5. *Therefore,* $2\frac{1}{2}$ *is* $\frac{1}{2}$ *of* 5.

2. $3\frac{3}{3}$ is $\frac{1}{3}$ of what number? $\frac{1}{4}$ of what number?
3. $5\frac{1}{6}$ is $\frac{1}{6}$ of what number? $\frac{1}{8}$ of what number?
4. $6\frac{3}{4}$ is $\frac{1}{4}$ of what number? $\frac{1}{8}$ of what number?
5. $4\frac{2}{5}$ is $\frac{1}{5}$ of what number? $\frac{1}{10}$ of what number?
6. $2\frac{1}{7}$ is $\frac{1}{11}$ of what number? $\frac{1}{12}$ of what number?

T. — 7. How many *thirds* are there in $2\frac{2}{3}$?

ANS. $\frac{8}{3}$.

Why $\frac{8}{3}$? *Because, if in* 1 *whole one there are* $\frac{3}{3}$, *in* 2 *whole ones there are* 2 *times* $\frac{3}{3}$; 2 *times* $\frac{3}{3}$ *are* $\frac{6}{3}$, *and the* $\frac{2}{3}$ *added makes* $\frac{8}{3}$. *Therefore, in* $2\frac{2}{3}$ *there are* $\frac{8}{3}$.

8. How many fifths are there in $4\frac{1}{5}$? In $3\frac{4}{5}$? In $5\frac{2}{5}$?

9. How many fourths are there in $6\frac{1}{4}$? In $5\frac{3}{4}$? In $7\frac{2}{4}$? In $4\frac{1}{4}$? In $8\frac{3}{4}$? Why?

10. How many sevenths are there in $2\frac{1}{7}$? In $3\frac{4}{7}$? In $4\frac{3}{7}$? In $2\frac{5}{7}$? In $5\frac{6}{7}$? Why?

11. How many sixths are there in $4\frac{2}{6}$? In $5\frac{1}{6}$? In $6\frac{5}{6}$? In $3\frac{3}{6}$? In $7\frac{4}{6}$? Why?

12. How many ninths are there in $3\frac{8}{9}$? In $6\frac{5}{9}$? In $4\frac{8}{9}$? In $7\frac{2}{9}$? In $4\frac{7}{9}$? Why?

13. How many eighths are there in $4\frac{5}{8}$? In $9\frac{1}{8}$? In $6\frac{7}{8}$? In $3\frac{3}{8}$? In $7\frac{4}{8}$? Why?

14. A gentleman divided $2\frac{1}{2}$ dollars among some poor children, giving them $\frac{1}{2}$ of a dollar apiece; how many children were there? Why?

15. If Charles earn $\frac{1}{4}$ of a dollar in a day, in how many days will he earn $2\frac{3}{4}$ dollars? Why?

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LESSON XVI.

U. — 1. 1 is what part of 2? Ans. ½ of 2.

Why ½? *Because* 1 *is one of the two equal parts into which* 2 *may be divided, or because* 2 *times* 1 *are* 2. *Therefore,* 1 *is* ½ *of* 2.

2. 1 is what part of 3? What part of 4?
3. 2 is what part of 4? What part of 6?
4. 3 is what part of 9? What part of 12?
5. 4 is what part of 20? What part of 24?
6. 5 is what part of 35? What part of 40?
7. 4 is what part of 36? What part of 44?
8. 2 is what part of 20? What part of 24?

V. — 9. 3 is what part of 4? Ans. ¾ of 4.

Why ¾? *Because, if* 1 *is* ¼ *of* 4, 3 *will be* 3 *times* ¼ *of* 4; 3 *times* ¼ *are* ¾. *Therefore,* 3 *is* ¾ *of* 4.

10. 2 is what part of 3? What part of 5?
11. 3 is what part of 7? What part of 8?
12. 4 is what part of 9? What part of 11?
13. 5 is what part of 12? What part of 13?
14. 8 is what part of 10? What part of 15?
15. 9 is what part of 16? What part of 17?

16. There are 12 inches in a foot; what part of a foot are 3 inches? Are 4 inches? 5 inches? 6 inches? 7 inches? 11 inches?

17. If you can buy a bushel of wheat for 8 shillings, what part of a bushel can you buy for 1 shilling? For 3 shillings? For 5 shillings?

18. A man had 7 dollars, and paid away 5 dollars for a hat; what part of his money did he pay away?

19. James bought an inkstand for 10 cents, and sold it for 13 cents; what part of the cost did he gain?

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LESSON XVII.

W. — 1. 8 is $\frac{4}{5}$ of how many times 5?

Ans. $2\frac{2}{5}$ times 5.

Why $2\frac{2}{5}$ times 5? *Because, if* 8 *is* $\frac{4}{5}$ *of some number,* $\frac{1}{5}$ *of* 8 *will be* $\frac{1}{5}$; $\frac{1}{5}$ *of* 8 *is* 4, *and* $\frac{5}{5}$, *or the whole number, will be* 3 *times* 4; 3 *times* 4 *are* 12. *Now,* 5 *is contained in* 12, $2\frac{2}{5}$ *times, since* $2\frac{2}{5}$ *times* 5 *are* 12. *Therefore,* 8 *is* $\frac{4}{5}$ *of* $2\frac{2}{5}$ *times* 5.

2. 10 is $\frac{5}{6}$ of how many times 4? Why?
3. 12 is $\frac{3}{4}$ of how many times 2? Why?
4. 15 is $\frac{3}{6}$ of how many times 10? Why?
5. 16 is $\frac{4}{5}$ of how many times 8? Why?
6. 24 is $\frac{8}{9}$ of how many times 12? Why?
7. 30 is $\frac{5}{11}$ of how many times 7? Why?
8. If $\frac{4}{5}$ of a barrel of flour cost 6 dollars, how many yards of cloth, at 4 dollars a yard, must be given in exchange for a barrel? Why?

X. — 9. $\frac{3}{4}$ of 16 is $\frac{4}{5}$ of what number? Ans. 15.

Why 15? *Because* $\frac{1}{4}$ *of* 16 *is* 4, *and* $\frac{3}{4}$ *is* 3 *times* 4; 3 *times* 4 *are* 12. *Now, if* 12 *is* $\frac{4}{5}$ *of some number,* $\frac{1}{5}$ *of* 12 *will be* $\frac{1}{5}$; $\frac{1}{4}$ *of* 12 *is* 3, *and* $\frac{5}{5}$, *or the whole number, will be* 5 *times* 3; 5 *times* 3 *are* 15. *Therefore,* $\frac{3}{4}$ *of* 16 *is* $\frac{4}{5}$ *of* 15.

10. $\frac{5}{6}$ of 18 is $\frac{3}{7}$ of what number? Why?
11. $\frac{3}{7}$ of 28 is $\frac{6}{10}$ of what number? Why?
12. $\frac{7}{8}$ of 36 is $\frac{4}{11}$ of what number? Why?
13. $\frac{5}{8}$ of 32 is $\frac{2}{3}$ of what number? Why?
14. A gentleman gave some money to Ezra and George. To Ezra he gave 24 cents, and $\frac{5}{8}$ of what he gave to Ezra was just $\frac{4}{5}$ of what he gave to George; how many cents did he give to George? Why?

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LESSON XVIII.

MISCELLANEOUS REVIEW.

1. Austin gave $\frac{1}{4}$ of a dollar for a reader, $\frac{2}{4}$ of a dollar for a geography and atlas, and $\frac{1}{4}$ of a dollar more for a grammar; how much did he pay for the whole? Why?

2. A little boy, having a large water-melon, gave $\frac{3}{4}$ of it away; what part of the melon had he left? Why?

3. Timothy divided a quart of chestnuts so that he could give $\frac{1}{8}$ of them to his brother, and $\frac{3}{8}$ to his sister; into how many parts did he divide them? What part of the whole did he keep for himself? Why?

4. How many are $\frac{1}{6}$ and $\frac{1}{6}$ and $\frac{3}{6}$ and $\frac{2}{6}$? Why?

5. How many are $\frac{1}{5}$ and $\frac{2}{5}$ and $\frac{2}{5}$ and $\frac{1}{5}$? Why?

6. How many are $\frac{7}{8}$ and $\frac{5}{8}$ and $\frac{4}{8}$, less $\frac{8}{8}$? Why?

7. How many are $\frac{9}{10}$ and $\frac{7}{10}$ and $\frac{4}{10}$, less $\frac{9}{10}$? Why?

8. If you had 1 dollar, and should spend $\frac{5}{6}$ of it, what part of a dollar would you have left? Why?

9. A man paid 6 dollars for a barrel of flour; how much did he pay for $\frac{1}{6}$ of it? For $\frac{2}{6}$? For $\frac{3}{6}$? For $\frac{4}{6}$? For $\frac{5}{6}$? Why?

10. There are $5\frac{1}{2}$ yards in one rod; how many yards in 9 rods? In 12 rods? In 10 rods? Why?

11. At 8 cents a pound, what will $6\frac{1}{2}$ pounds of cheese cost? $5\frac{1}{4}$ pounds? $7\frac{3}{4}$ pounds? Why?

12. What will $\frac{1}{4}$ of a yard of broadcloth cost, at 7 dollars a yard? At 5 dollars a yard? Why?

13. What cost $\frac{2}{3}$ of a bushel of apples, at 20 cents a bushel? At 24 cents a bushel? At 27 cents a bushel? Why?

14. How many days are there in $\frac{1}{7}$ of 16 days?

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LESSON XIX.

MISCELLANEOUS REVIEW.

1. At 9 dollars a ton, what part of a ton of hay can be bought for 1 dollar? For 2 dollars? For 3 dollars? For 4 dollars? For 5 dollars? For 6 dollars? For 7 dollars? For 8 dollars? Why?

2. At $8\frac{1}{2}$ dollars a barrel, what will 4 barrels of fish cost? 6 barrels? 8 barrels? Why?

3. How many are 5 times $1\frac{3}{5}$? Why?

4. How many are 3 times $7\frac{1}{3}$? Why?

5. How many are 6 times $3\frac{5}{7}$? Why?

6. How many are 4 times $9\frac{3}{4}$? Why?

7. What cost $\frac{1}{4}$ of a pound of starch, at 8 cents a pound? What cost $\frac{3}{4}$ of a pound? Why?

8. What cost $\frac{1}{8}$ of a yard of cloth, at 9 dollars a yard? What cost $\frac{5}{8}$ of a yard? Why?

9. When oats are 30 cents a bushel, what will $\frac{1}{6}$ of a bushel cost? What will $\frac{7}{10}$ of a bushel cost?

10. How many fifths are there in 3? In 7? In 5?

11. How many ninths are there in 2? In 4? In 8?

12. How many fourths are there in 6? In 9? In 7?

13. At 8 shillings a pound, what will $4\frac{3}{4}$ pounds of tea cost? $6\frac{1}{4}$ pounds? Why?

14. What will 9 caps cost, at $\frac{4}{5}$ of a dollar apiece? What will 12 caps cost? 10 caps? Why?

15. A gentleman paid $4\frac{3}{4}$ dollars for $\frac{1}{8}$ of an acre of land; what will an acre cost? Why?

16. When $2\frac{1}{8}$ dollars are paid for $\frac{1}{7}$ of a barrel of quinces, what will a barrel cost? Why?

17. What cost 8 slates, at $\frac{1}{10}$ of a dollar apiece? What cost 10 slates? 12 slates? Why?

18. What cost 9 globes, at $\frac{7}{8}$ of a dollar apiece?

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LESSON XX.

MISCELLANEOUS REVIEW.

1. Charles paid 18 cents for $\frac{2}{5}$ of a kite; what was the whole price of the kite? Why?

2. A man paid 6 dollars for $\frac{3}{4}$ of a cord of wood; how much would a cord cost, at that rate? Why?

3. 12 is $\frac{1}{4}$ of what number? Why?

4. 20 is $\frac{5}{6}$ of what number? Why?

5. $3\frac{3}{4}$ is $\frac{1}{4}$ of what number? Why?

6. $7\frac{1}{5}$ is $\frac{1}{4}$ of what number? Why?

7. 25 is $\frac{3}{8}$ of what number? Why?

8. 32 is $\frac{5}{8}$ of what number? Why?

9. In $\frac{5}{8}$ of a bushel there are 20 quarts; how many quarts in a whole bushel? Why?

10. There are 35 minutes in $\frac{7}{12}$ of an hour; how many minutes in a whole hour? Why?

11. In a certain school $\frac{5}{7}$ of the scholars are studying geography, and 10 are learning to write; how many scholars are there in the school? Why?

12. 3 times 4 is $\frac{1}{5}$ of what number? Why?

13. 2 times 8 is $\frac{4}{5}$ of what number? Why?

14. 4 times 9 is $\frac{6}{7}$ of what number? Why?

15. 5 times 4 is $\frac{2}{3}$ of how many times 7?

16. 6 times 3 is $\frac{9}{10}$ of how many times 8?

17. 2 times 12 is $\frac{3}{8}$ of how many times 9?

18. 8 times 6 is $\frac{4}{5}$ of how many times 11?

19. At 36 dollars a hogshead, what will $\frac{1}{4}$ of a hogshead of molasses cost? $\frac{1}{6}$ of a hogshead? $\frac{1}{9}$ of a hogshead? $\frac{1}{12}$ of a hogshead? Why?

20. At 20 cents a yard, what will $\frac{1}{4}$ of a yard of muslin cost? $\frac{3}{4}$ of a yard? $\frac{1}{6}$ of a yard? $\frac{5}{6}$ of a yard? $\frac{7}{8}$ of a yard? Why?

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LESSON XXI.

MISCELLANEOUS REVIEW.

1. If 6 men should perform a piece of work in 9 days, what part of the work would 1 man do? What part would 2 men do? 3 men? 4 men? 5 men?

2. How many fifths are there in $2\frac{3}{5}$? In $4\frac{1}{5}$? In $3\frac{4}{5}$? In $5\frac{2}{5}$? Why?

3. How many eighths are there in $4\frac{3}{8}$? In $6\frac{5}{8}$? In $9\frac{7}{8}$? In $5\frac{1}{8}$? In $9\frac{1}{8}$? Why?

4. 18 is $\frac{2}{5}$ of how many times 7? Why?

5. 30 is $\frac{6}{7}$ of how many times 4? Why?

6. 48 is $\frac{8}{9}$ of how many times 5? Why?

7. 66 is $\frac{11}{12}$ of how many times 10? Why?

8. If eight men can do a piece of work in 7 days, what part of the work can they do in 1 day? In 2 days? In 3 days? In 4 days? In 5 days? In 6 days? Why?

9. A farmer has $\frac{3}{4}$ of his sheep in one pasture, and 12 in another; how many sheep has he in the two pastures? Why?

10. A gentleman divided 1 dollar between three poor children. To the first he gave $\frac{2}{5}$ of it, to the second $\frac{3}{5}$, and the remainder to the third; what part of a dollar did he give to the third? Why?

11. $\frac{3}{4}$ of 12 is $\frac{3}{5}$ of what number? Why?

12. $\frac{4}{7}$ of 14 is $\frac{2}{5}$ of what number? Why?

13. $\frac{7}{8}$ of 24 is $\frac{3}{4}$ of how many times 9? Why?

14. $\frac{4}{5}$ of 27 is $\frac{2}{7}$ of how many times 4? Why?

15. $\frac{4}{5}$ of 30 is $\frac{2}{3}$ of how many times 12? Why?

16. $\frac{5}{8}$ of 72 is $\frac{5}{6}$ of how many times 11? Why?

17. If $\frac{5}{8}$ of a post is in the ground, and 6 feet out, what is the length of the post? Why?

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TABLES OF MONEY, WEIGHTS, AND MEASURES.

UNITED STATES MONEY.

1. UNITED STATES MONEY is the legal currency of the United States.

TABLE.

10 Mills (m.)	make	1 Cent,	marked	ct.
10 Cents	"	1 Dime,	"	d.
10 Dimes, or 100 cents,	"	1 Dollar,	" doll.	or $
10 Dollars	"	1 Eagle,	"	E.

PARTS OF ONE DOLLAR.

2. The following table gives the aliquot parts of a dollar in United States money, and also the other fractional parts of a dollar in common use.

TABLE.

5 cents = $\frac{1}{20}$ of a doll.		25 cents = $\frac{1}{4}$ of a doll.	
6¼ cents = $\frac{1}{16}$ of a doll.		33⅓ cents = $\frac{1}{3}$ of a doll.	
8⅓ cents = $\frac{1}{12}$ of a doll.		37½ cents = $\frac{3}{8}$ of a doll.	
10 cents = $\frac{1}{10}$ of a doll.		50 cents = $\frac{1}{2}$ of a doll.	
12½ cents = $\frac{1}{8}$ of a doll.		62½ cents = $\frac{5}{8}$ of a doll.	
16⅔ cents = $\frac{1}{6}$ of a doll.		75 cents = $\frac{3}{4}$ of a doll.	
20 cents = $\frac{1}{5}$ of a doll.		87½ cents = $\frac{7}{8}$ of a doll.	

ENGLISH MONEY.

3. English Money is the legal currency of England.

TABLE.

4 Farthings (qr. or far.)	make	1 Penny,	marked	d.
12 Pence	"	1 Shilling,	"	s.
20 Shillings	"	1 Pound,	"	£
21 Shillings sterling	"	1 Guinea,	"	guin.
20 Shillings sterling	"	1 Sovereign,	"	sov.

TROY WEIGHT.

4. Troy Weight is the weight used in weighing gold, silver, and jewels.

TABLE.

24 Grains (gr.)	make	1 Pennyweight,	marked	dwt.
20 Pennyweights	"	1 Ounce,	"	oz.
12 Ounces	"	1 Pound,	"	lb.

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AVOIRDUPOIS WEIGHT.

5. Avoirdupois Weight is used in weighing almost every kind of goods, and all metals except gold and silver.

TABLE.

16 Drams (dr.)	make	1 Ounce,	marked	oz.
16 Ounces	"	1 Pound,	"	lb.
28 Pounds	"	1 Quarter,	"	qr.
4 Quarters	"	1 Hundred Weight,	"	cwt.
20 Hundred Weight	"	1 Ton,	"	T.

NOTE. In several of the United States, 25 pounds make one quarter, and 100 pounds make 1 hundred weight.

APOTHECARIES' WEIGHT.

6. Apothecaries' Weight is used in mixing medicines. But medicines are usually bought and sold by avoirdupois weight.

TABLE.

20 Grains (gr.)	make	1 Scruple,	marked	sc. or ℈.
3 Scruples	"	1 Dram,	"	dr. or ʒ.
8 Drams	"	1 Ounce,	"	oz. or ℥.
12 Ounces	"	1 Pound,	"	lb. or ℔.

LONG MEASURE.

7. Long Measure is used in measuring distances, or where length is required, without regard to breadth or depth.

TABLE.

12 Inches (in.)	make	1 Foot,	marked	ft.
3 Feet	"	1 Yard,	"	yd.
5½ Yards, or 16½ Feet,	"	1 Rod, or Pole,	"	rd.
40 Rods	"	1 Furlong,	"	fur.
8 Furlongs, or 320 Rods,	"	1 Mile,	"	m.
3 Miles	"	1 League,	"	lea.
69½ miles (nearly)	"	1 Degree,	"	deg. or °
360 Degrees	"	1 Circle of the Earth.		

CLOTH MEASURE.

8. Cloth Measure is used in measuring cloth, ribbons, lace, and other articles sold by the yard or ell.

TABLE.

2¼ Inches (in.)	make	1 Nail,	marked	na.
4 Nails, or 9 in.,	"	1 Quarter of a Yard,	"	qr.
4 Quarters	"	1 Yard,	"	yd.
3 Quarters	"	1 Ell Flemish,	"	E. F.
5 Quarters	"	1 Ell English,	"	E. E.

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SQUARE MEASURE.

9. Square Measure is used in measuring surfaces of all kinds, where length and breadth only are considered.

TABLE.

144	Square inches (sq. in.)	make	1	Square foot, marked	sq. ft.
9	Square feet	"	1	Square yard, "	sq. yd.
30¼	Sq. yds., or 272¼ Sq. ft.,	"	1	Sq. rod or pole, "	sq. rd.
40	Square rods	"	1	Rood, "	R.
4	Roods, or 160 square rods,	"	1	Acre, "	A.
640	Acres	"	1	Square mile, "	sq. M.

CUBIC OR SOLID MEASURE.

10. Cubic or Solid Measure is used in measuring such bodies or things as have length, breadth, and thickness.

TABLE.

1728	Cubic inches (cu. in.)	make	1	Cubic foot, marked	cu. ft.
27	Cubic feet	"	1	Cubic yard, "	cu. yd.
40	Cubic feet	"	1	Ton, "	T.
16	Cubic feet	"	1	Cord foot, "	c. ft.
8	Cord feet, or 128 cu. ft.,	"	1	Cord of wood, "	C.

WINE MEASURE.

11. Wine Measure is used in measuring all kinds of liquids, except milk, ale, and beer.

TABLE.

4	Gills (gi.)	make	1	Pint, marked	pt.
2	Pints	"	1	Quart, "	qt.
4	Quarts	"	1	Gallon, "	gal.
31½	Gallons	"	1	Barrel, "	bar.
42	Gallons	"	1	Tierce, "	tier.
63	Gallons, or 2 barrels,	"	1	Hogshead, "	hhd.
2	Hogsheads	"	1	Pipe, or Butt, "	pi.
2	Pipes, or 4 Hogsheads,	"	1	Tun, "	tun.

DRY MEASURE.

12. This measure is used in measuring grain, fruit, salt, coal, &c.

TABLE.

2	Pints (pts.)	make	1	Quart, marked	qt.
8	Quarts	"	1	Peck, "	pk.
4	Pecks, or 32 Quarts,	"	1	Bushel, "	bu.
8	Bushels	"	1	Quarter, "	qr.
36	Bushels	"	1	Chaldron, "	ch.

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MEASURE OF TIME.

13. This measure is applied to the various divisions and subdivisions into which time is divided.

TABLE.

60	Seconds (sec.)	make	1	Minute,	marked m.
60	Minutes	"	1	Hour,	" h.
24	Hours	"	1	Day,	" da.
7	Days	"	1	Week,	" w.
4	Weeks	"	1	Lunar month,	" mo.
12	Calendar months, or 365 da.		1	Year	" yr.
100	Years	make	1	Century	" cen.

14. The following table gives the names of the 12 calendar months, in their order, and the number of days in each.

TABLE.

1.	January	has	31 days.	7.	July	has	31 days.
2.	February	"	28 days.	8.	August	"	31 days.
3.	March	"	31 days.	9.	September	"	30 days.
4.	April	"	30 days.	10.	October	"	31 days.
5.	May	"	31 days.	11.	November	"	30 days.
6.	June	"	30 days.	12.	December	"	31 days.

15. The number of days in each month is also stated in the following lines.

Thirty days hath September,
April, June, and November;
And all the rest have *thirty-one*,
Save *February*, which alone
Hath *twenty-eight*; and *this*, in fine,
One year in four hath *twenty-nine*.

16. MISCELLANEOUS TABLE.

12	Units, or single things,	make	1	Dozen.	
12	Dozen, or 144 units,	"	1	Gross.	
12	Gross, or 144 dozen,	"	1	Great Gross.	
20	Units, or single things,	"	1	Score.	
60	Pounds of wheat	"	1	Bushel.	
196	Pounds of flour	"	1	Barrel.	
200	Pounds of beef, or pork,	"	1	Barrel.	
24	Sheets of paper	"	1	Quire.	
20	Quires of paper	"	1	Ream.	

A sheet of paper folded in *two* leaves is called a *folio*.
A sheet folded in *four* leaves is called a *quarto*, or 4 *to*.
A sheet folded in *eight* leaves is called an *octavo*, or 8 *vo*.
A sheet folded in *twelve* leaves is called a *duodecimo*, or 12 *mo*.
A sheet folded in *sixteen* leaves is called a 16 *mo*.
A sheet folded in *eighteen* leaves is called an 18 *mo*.

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FIGURES IN GEOMETRY.

The children may learn the names of these figures, study their forms, and practice drawing them on their slates.

A straight line.

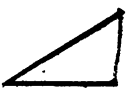
Parallel straight lines.

An inch in length.

Half inch.

Quarter inch.

A Right angle.

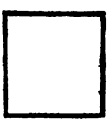


Acute angle.

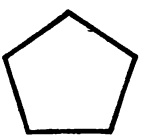
Obtuse angle.

Triangle.

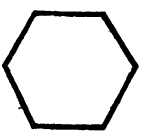
Rectangle.



Square.

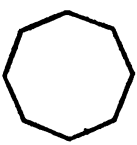


Pentagon.

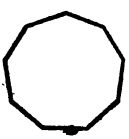


Hexagon.

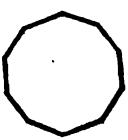
Heptagon.



Octagon.



Nonagon.



Decagon.

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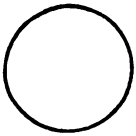
Square and diagonal.

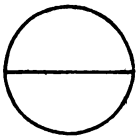
Prism.

Pyramid.

Cone.

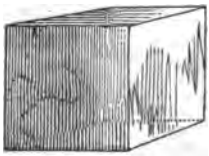


Circle.

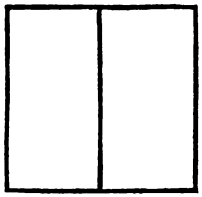


Circumference and diameter

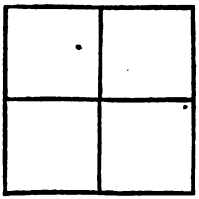
Sphere.



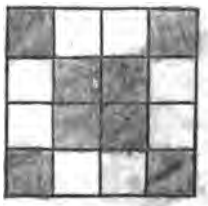
Cube.



Halves of a square inch.



Half inch squares.



Quarter inch squares.

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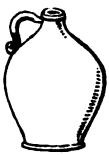
LESSONS IN DRAWING.

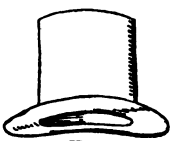
The following objects may be drawn by the pupils, first on their slates, and then on paper, or in a blank book.

Tumbler.

Mug.

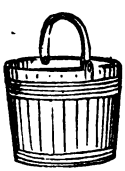

Jug.

Cup.


Hat.

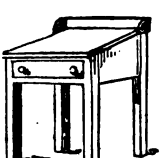
Shoe.

Scissors.


Pail.

Pitcher.

Knife.


Desk.

Stool.

Chair.

House.

Schooner.

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Leaf.

Pear.

Apple.

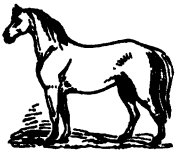
Pig.

Cat.

Dog.

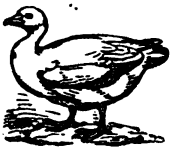
Sheep.

Cow.



Horse.

Bird.



Goose.

Fish.

Head.

Boy.

Girl.

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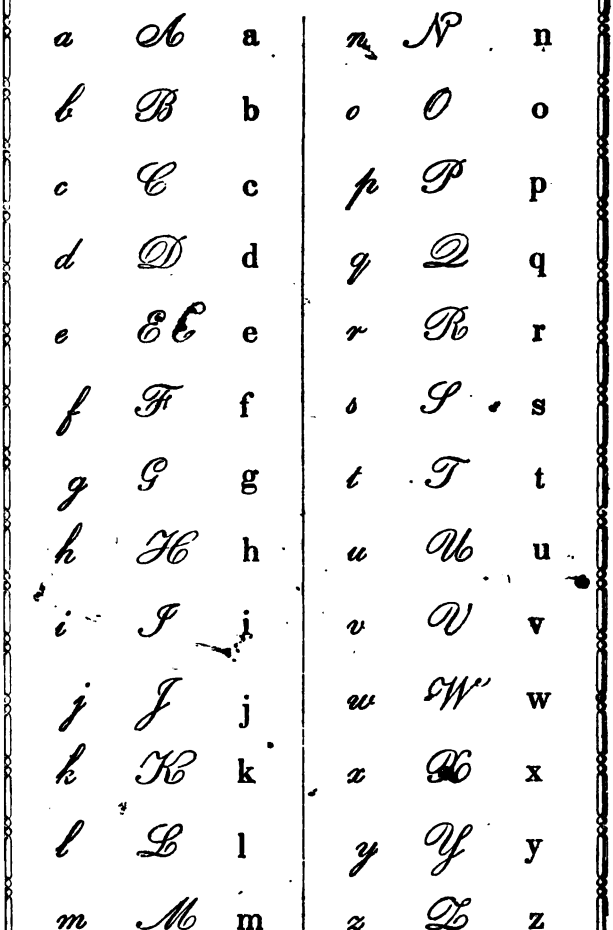
ALPHABET IN SCRIPT.



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